

VISITOR SATISFACTION  
IN ICU AND RECOVERY WAITING ROOMS  
IN ACUTE-CARE HOSPITALS

by

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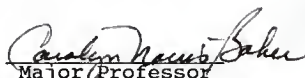
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## Chapter One

### INTRODUCTION

Visitors play more than a passive role in the recovery of the patients and, in reality, help in improving the patients' morale (Deasy, 1985). These visitors are subjected to the psycho-social effects of the hospital environment. Since taking care of the visitors is part of taking care of the patient, environments that encourage and support the visitors' behavior need to be designed sensitively. The waiting room environment, in which visitors spend a major portion of their time, needs to be studied in order to provide a more satisfying and a less stressful effect on the user. The Patient and Visitor Participation Project, conducted by Carpman and her associates at the University of Michigan Hospitals, provided a set of research-based guidelines to improve the physical environment of the hospital in order to achieve a higher level of satisfaction (for the patients, medical personnel, and the visitors) (Carpman et al, 1986). Specific recommendations for general and high stress waiting areas are included.

The primary purpose of this research is to test Carpman's guidelines' (1986) for high stress waiting areas such as the ICU waiting rooms in hospitals of different

sizes in a different geographical region. Second, the research will explore which of the design recommendations have a higher predictive value for visitor satisfaction. The following sections will present [a] background information on, and the need for a better understanding of, the design needs of the visitors in the hospitals, [b] a discussion on the types of waiting room environments with a special emphasis on high stress waiting room, [c] stress, and models of stress, and their relationship to environmental satisfaction, [d] an overview of the design issues that are known to determine environmental satisfaction, [e] Carpmann's guidelines, and the design issues that need to be evaluated, and [f] the proposed methodology, and analysis of data.

## BACKGROUND

### Hospital Care Today

One of the most complex building types that architects deal with is the large general hospital (Deasy, 1985). Medical technology is expanding rapidly, requiring more and more highly specialized equipment. As specialized treatment techniques increase, so do needs for specialized personnel, resulting in the need to design a more complex

institution. Hospices, birthing centers, cardiac facilities, eye-care facilities, dental clinics, etc., are all results of specialization in medical fields that require moving away from the general approach to health care design that architects knew not too long ago.

A large number of health care facilities are becoming concerned about their position in a competitive market (Carpman et al, 1986). This trend coupled with the emergence of what Toffler (1982), in his book Megatrends, calls a prosumer society, demands hospitals that can attract clientele and treat them efficiently. Demographic trends foresee continued urbanization of America in general, changes in quality of life and availability of education. As individuals become more knowledgeable and take more responsibility for their lives, their expectations of becoming full partners in their health care will grow. The result will be a society that will demand a more active role in its health care (Panther, 1984). Also, as changes in society occur, the older population will become more visible, demanding, as Carpman (1986) believes greater service from the health care system.

#### Patient Care and Visitors

When hospitals were few and hospitalization was

rare, and for most parts, medical care was the family's responsibility. The individuals' actual treatment and convalescence took place within the familiar environment of their own homes, with family members temporarily adopting the roles of nurses and caretakers (Vogel, 1980). According to Rosenfield (1971), it is more economical and psychologically desirable for a patient to remain in his accustomed environment when possible. In-patient care imposes on patients a role characterized by submission to professional authority, enforced cooperation, and depersonalized service (Lorber, 1979). Patients come to the hospital because they have problems that cannot be treated at home. The hospital is a special place and should give patients a feeling that they have put themselves in "hands of an organization that has the knowledge, the expertise, the competence and the efficiency" to take care of them (Deasy, 1985), be humane, welcoming and provide reassurance (Cox and Groves, 1981). But Ronco (1972) points out that psychological considerations involving the patients are frequently rejected in favor of enhancing staff efficiency. He adds that ignoring patients needs and denying them the opportunity at least to approximate various normal activities (such as meeting friends, dining together, watching TV with family, etc.) makes the patient's burden heavier, which in turn may result in a need for increased care. Any increase in medical care would be undesirable

because of the shortages in medical personnel and finances.

Hospitals can be stressful due to the nature of their organization (Shumaker and Reizenstein, 1982). Besides costs, appearance and utility seem to be the primary considerations in the minds of the architects, hospital administrations, board of trustees, and others who are responsible for the planning of the facility (Brown, 1961). Information about how perceptual and emotional needs of the patients, visitors and staff relate to the hospital environment does not seem to be widely used by the hospital architects (Welch, 1977). Patients and visitors represent particularly vulnerable groups. They are virtually powerless in what they often perceive as an intimidating environment. They visit the health care facility under what are often emotionally stressful, and physically debilitating conditions. At this time they need a supportive, non-stressful environment, and they have little capacity to deal with a complex or confusing one (Carpman, Grant, and Simmons, 1986). The moment the patient or the visitor arrives at the health care facility, the design will convey certain symbolic messages. The quality of the environment is important far beyond the image it presents of the health care facility, for the therapeutic aspects have to be considered also. The design of the facility, its color scheme, arrangement of the furniture, and accommodation of

the family members, are all part of the patient's movement towards recovery (Canter and Canter, 1979). Although the therapeutic aspects of the design are not meant to be a substitute for medical and nursing care, they can enhance the efforts of the health care professionals by creating a healthier setting for examination, treatment, and recovery. Just as the physical design can encourage or discourage the maintenance of sterile conditions, designs can encourage or discourage certain behaviors.

#### Visitors

A singular focus upon patients and staff members ignores a significant subset of people who spend time in a hospital--those people who visit and use the hospital on a daily basis as...visitors (Pendall, Coray, and Veneklasen, 1975). Visitors are an important sub-set of the set of people that use the health care facilities. The importance of family and friends of the patient is often overlooked whenever user needs are considered at the time of designing of the facility. Visitors are part of the resources that a patient can call on for help in coping with the stress of illness and a strange environment (Deasy, 1985), as a result of which they help in maintaining patients' morale. According to Brown (1961) dining tables and eating with family, friends and colleagues at work are distinct features of American life but the hospitals have not

capitalized these symbols. Visiting is often determined by rules rather than on the basis of individual needs. It is just not enough to seek design solutions based on information provided by the medical and nursing staff. Even though their primary concern is patient care, their perspective on what is desirable design will not necessarily encompass the views of the patients and/or the visitors (Parston, 1983). Only a handful studies have been done to show what the detailed needs of the visitors are (Reizenstein, 1982). As Cox and Groves (1981) state, provisions should be made for people accompanying the patient who may be in a distressed condition. For example, every family of the patient is in a state of crisis when one of its members has had a major surgery (Bloom and Lynch, 1979). They themselves need emotional support, a ready supply of information on the condition of the patient, and an easy access to the patient.

Waiting areas are places where patients and visitors spend a part of their lives. Since taking care of the patient's visitors is part of taking care of the patient (Deasy, 1985), the environment that encourages and supports the visitors' behavior needs to be designed sensitively, too. It should support and cater to the variety of activities in which the visitors often engage. Waiting areas do not accommodate this range of activities that are

expected to occur (Petersen, 1981). As part of the Patient and Visitor Participation project (Carpman et al, 1986), various activities such as people watching, reading, talking, watching TV, working on crafts, playing with children, waiting for transportation, resting and relaxing, using the rest rooms, etc, were observed. Hence, the impact of the waiting room environment on the visitor becomes very important. Its location, size, aesthetic quality, its sociofugal /sociopetal character, its physical and psychological attributes (refer to Carpman et al, 1986), all contribute to determine the behavior of the visitor (or the user). As a result, the space may prove to be a source of stress or of comfort, depending on the way it has been designed.

#### GENERAL AND HIGH STRESS WAITING

Waiting as an activity has seldom been considered as an important element in the design process of a hospital. For different people involved in the process it means different things (according to the varying levels of importance). For example, in the course of the design of a new ICU, physicians argued that a visitors waiting area should be eliminated and the space be rather used for clinical purposes (Carpman & Grant, 1984). Hospital client representatives typically focus on staff and patient

requirements and only think of visitors when it comes to designing a waiting area - a very token gesture.

For a lot of people, including the visitors, going to a hospital is viewed with apprehension. The Out-patient Department is usually the first introduction to the hospital and many visitors may be, just like the patients, nervous and may need reassurance (Deasy, 1985). One study at the University of Michigan hospital found that many activities, including finding a place to park, finding a comfortable place to wait, worrying about the patient, etc., were considered stressful to a varying degree (Reizenstein et al, 1981). This stress would inevitably harm the very purpose of the visitor being there, that is, to offer support and bolster morale of the patient.

Waiting rooms are one of the primary areas a visitor is expected to spend most of the time. "Humanizing" the wait, as earlier stated, maybe the toughest design and managerial problem encountered (Green, 1976), partly because very little data, research based and otherwise, is available. In fact, very few articles focus on visitor needs (Berstein, Manchester, and Weaver, 1980 ; Nicklin, 1979). However the Patient and Visitor Participation Project (Carpman et al, 1986) brings up four key design issues that pertain to reducing the stress of the visitors.

They are :

1. Wayfinding
2. Physical comfort
3. Privacy
4. Symbolic meaning

The way each of these issues affects the visitor will be addressed in detail later under "Environmental Issues".

#### General Waiting

Waiting takes place in various types of spaces in a hospital. General waiting occurs at the very onset of the entrance to a hospital facility. General waiting (non-high stress) can happen at the main lobby, at the entrance to the Out-patient Department, or at the entry to the administration department. Some waiting areas are no bigger than a small room and others can be very big halls. Some support singular functions (waiting to be called in), while others can be multi-purpose ( waiting for a friend, waiting to use a rest room, waiting for a taxi, waiting for information, etc.). Many of the people waiting are relatives or friends of patients who may not wish to accompany patients to the actual clinic (Cox and Groves, 1981). Reizenstein and her associates (1982) state that

waiting can be long and tedious, but good design can help lessen some of the negative aspects to this experience. Welch (1977) describes the general waiting in hospitals as something similar to an airline terminal. The space is used by a large number of people of diverse backgrounds, with a wide range of feelings and needs, waiting for varying lengths of time at any hour of the day or night. Moods generally range from anticipation to anxiety. The thing for which people are waiting is totally removed from the place where they wait. Besides visitors themselves, some patients, a few salesmen, staff members, etc, are found in this diverse group.

Though diverse in backgrounds, some of their needs can be similar - the need to know they have not been forgotten by those in charge, need to be physically comfortable, need to be close to the amenities such as telephones, rest rooms, drinking fountains, the need to have something to do, watch or read, and the need to be able to choose whether to interact with others or to keep to themselves (Carpman et al, 1986), the need to organize the physical environment so that it maximizes the freedom of choice, the need to privacy (Proshansky et al, 1970), the need to obtain information and counsel (Brown, 1963). The issue of overcoming problems like overcrowding, break down of environmental systems, etc, that can affect human

comfort, need to be addressed and tackled in the waiting rooms.

### High Stress Waiting

Hospitals in general can be stressful environments for everyone due, in part, to the nature of the organization (Shumaker and Reizenstein, 1982, Reeder and Manksen 1979). ICUs are areas in acute-care departments where patients are under strict observation to get them through a crisis. Hospitals often have special ICU lounges where the family members of the patients, whose visitation duration is severely restricted in terms of time and the number of people, may wait round the clock. Although they cannot be with the patient, they at least have a place to wait in between the short visits to the patient's bedside (Nierenberg and Janovich, 1985).

The presence of high stress is due to the visitors' concern for the patient who is critically ill. In response to the seriousness of the situation, the visitor in the high stress waiting tends to behave differently than the visitor in less stressful waiting areas (Carpman et al, 1986). It is inevitable that the design needs of high stress waiting address not only those issues that pertain to the general waiting but additional ones.

Requirements such as the need to keep vigils in the waiting room so as to be in close proximity with the patient, access to important information regarding the status of the patient, the ability to express grief in solitude and in less stressful surroundings, the possibility to form sub-groups based on family sizes in the waiting space (Cox and Groves 1981, Pendall et al, 1975), the need to be left alone sometime to seek auditory and visual privacy in times of excess grief and distress, the need to perform daily hygiene functions (Carpman et al , 1986) must be considered in the design. These are some requirements that are not necessarily associated with general waiting.

ICU waiting is a high stress waiting area that can put the family of the patient under a lot of stress ( for environmental, and psychosocial reasons), anxiety (concern about the critically ill patient), and physical discomfort (loss of control over factors pertaining to the physical environment). The waiting area needs to provide alternatives that would help lower or eliminate the stress and anxiety of the users and reduce the discomfort that could be caused by environmental features of the space. The frustration that may evolve out of the family's inability to be constantly at the patient's bedside can only be offset by access to a steady flow of status reports and

more frequent visitations. In an ICU waiting room, emotions can run high. A highly visible supportive staff, that can take care of the emotional and functional needs of the visitors in times of need could be a positive factor that could bring about a substantial reduction in the level of stress and anxiety among the family.

## ENVIRONMENTAL STRESS

### Models of Stress

Stress is the process by which environmental events or forces, called the stressors, threaten an organism's existence or well-being, and by which the organism responds to the threat (Baum, Singer, and Baum, 1982). Lazarus' (1966), and Lazarus and Folkman's (1984) conceptualization has proven to be an important contribution to the study of stress. When exposed to potentially stressful situations, people appraise the setting and make judgments about how threatening, harmful, or challenging it is. If a situation is judged to be stressful, secondary appraisals are made concerning how to cope with it. Secondary appraisals may affect the degree to which an event is perceived as threatening, challenging or irrelevant. If the coping is

ineffective, it is perceived as threatening. If the copier has some confidence, he/she is likely to challenge the threat. If his/her reserves are more than sufficient, he/she remains unaffected. Challenge interpretations are characterized by a belief that the stress can be dealt with effectively. Stressors that are taxing but that can be overcome are more likely to generate challenge appraisals than interpretations involving threat or harm or loss (Baum, Singer, and Baum, 1982).

A literature review produced two main models of stress. The physiological model (Selye, 1956) proposes that a common pattern of bodily reactions consistently occur regardless of the particular insults the body encounters. A three step process then comes into effect : alarm, resistance, and exhaustion. After which the body needs fresh and renewed energy (of which it has a finite amount). This is also called GAS - General Adaptative Syndrome. The psychological model states that we not only respond to dangers or threats that have materialized; we are equally affected by expectations of these events, and by symbols of danger experienced previously (Wolf and Goodell, 1968). The end reaction can either be a state of trauma (with possible disease consequences), denial (pain denied), or/and intellectual conditions (aloofness) (Lazarus et al., 1964).

## Coping

Coping is an important part of the stress response. Lazarus (1966) proposed that these responses can take manipulative or accommodative forms. They may be direct action responses (where the individual directly tries to manipulate or alter his/her relationship to the stressful situation). Thus the person may change the setting, flee, or otherwise remove the physical presence of the stressor. When this is not possible, palliative coping may become necessary. Here, the individual accommodates the stressful situation by altering his or her internal environment. Taking drugs, using alcohol, learning to relax, creating or using psychological defense mechanisms, or engaging in meditation are examples of this type of coping.

## Control

Perceptions of control is the degree to which a stressor is seen as being under an individual's control. When a stressor is seen as unpredictable, greater costs will be exacted. When control is available, and is used effectively by some people and not others, stress may be even greater for the ones with no control. The comparative failure may increase the problem (Glass and Singer, 1972).

James Averill (1973) explains that there are three types of personal control which people can exert over

threatening circumstances : behavioral, cognitive, and decisional control. Behavioral control is the availability of a response that can directly modify a threatening event. For example, a person may modify the situation through environmental controls. Cognitive control refers to the way people interpret a threatening situation. For example, the person trying to cope could trade off certain comforts to achieve other comforts. Predictability may even be considered an example of cognitive control in that it provides a form of informational control over a stressor. Decisional control is the range of choices available to an individual. Comfort could be achieved on the basis of the fact that a range of controls (or options) are available.

According to Averill (1973), personal control will not always reduce stress. Laboratory studies have found that behavioral control reduces the negative psychological effects of noise (Glass and Singer, 1972; Glass, Singer, and Freidman, 1968; Glass, Singer, and Pennebaker, 1977). The beneficial effects of personal control occur as long as the subjects believe they can terminate the noise (for example, a loud TV or a bunch of noisy children), even if no measure is taken to do so.

## ENVIRONMENTAL DESIGN ISSUES

On page 10, four key issues were mentioned that may have a substantial impact as stressors on the visitors in a hospital and could determine the satisfaction level of the visitors with their environment. Those four environmental design issues are : wayfinding, physical comfort, privacy and territoriality, and symbolic meaning.

### Wayfinding

Large complex buildings like hospitals are often like mazes, particularly for patients and visitors who visit them infrequently. Not being able to find ones way around between various destinations leads to a sense of helplessness and frustration. The characteristics of the visit, the setting, and the management policies often combine to make wayfinding unusually stressful (for example, finding one's way from the elevator lobby or the ICU beds area to the ICU waiting room). Hospital layout is often a patchwork design that is difficult to negotiate. To expend precious energy on finding their way within the hospital is seen by the visitors as an insult (Reizenstein et al, 1981; Reizenstein and Grant, 1982). The problem is exacerbated by the fact that many hospitals do not have a comprehensive and understandable wayfinding system (Carpman, Grant, and Simmons 1984; Weisman 1982).

Wayfinding has been hypothesized as a significant cause of environmentally induced stress, but there are few empirical studies that examine wayfinding behavior and attitudes in detail.

#### Physical Comfort

A comfortably designed environment could particularly mitigate the stress of a hospital unit. Factors that could affect comfort and induce stress, include, noise, lighting, body positions, odors, food, sleep, etc. A brief discussion on their effect on human comfort is necessary. Noise can cause negative psychological effects, distressed emotions, (Glass and Singer, 1972), and social after-effects like aggression (Donnerstein and Wilson, 1976). Perceived control over noise can eliminate these negative outcomes (Glass and Singer, 1972). (An example of this phenomenon could be the ability to shut off street noise or the noise from a loud TV through environmental controls). Lighting can cause visitor discomfort depending on its intensity, glare, and distribution. Working in conjunction with variables such as flooring materials, reflectivity, and window treatment. Lighting can induce discomfort and stress (Flynn and Seigel, 1970; Lam, 1977). Carpman and Grant (1984) suggest that hospitals can create a warmer and less institutional ambience by manipulating light intensity, distribution, and

color. The control of lighting intensity (natural and artificial) through environmental means is another tool to reduce stress caused by the environment.

Ergonomic designs of seating systems, tables, shelves, and the like can dictate body positions. Aspects of this design add another dimension to the physical comfort of the visitor who has to spend considerable time sitting in one position or spot. Location of amenities such as light switches or TV also help determine physical comfort. Key decisions need to be made regarding selection of such design elements that induce body comfort rather than stress. These decisions need to be based on scientific findings and tests conducted on users over a period of time (Carpman and Grant, 1984; Reizenstein and Grant, 1983). Odors such as smoke from cigarettes, or stale food are considered as stressors by visitors in hospitals (Reizenstein and Grant, 1982). They found that odors can lead to discomfort on the part of the visitors. Carpman et al (1986) call odor a subtle aspect of the physical environment but yet typically associated with hospitals. Good ventilation, the right choice of non-odor-retaining materials, and frequent housekeeping, can make the presence of odors less obvious. Policies such as segregating smokers from non-smokers can effectively increase the level of comfort of the non-smoking visitor.

Easy access to food services is often a neglected feature of the design thought and is usually included, if ever, as an after-thought. Visitors may consider any impedance in their access to the food services as a source of frustration and annoyance (Reizenstein and Grant, 1982). Aspects such as layout, location, size of dispensing units, and types of food items, are all important when considering the issue of provision of food. Carpman and her colleagues state in Design That Cares (1986) that to hospitals to develop an image, that they care, is an important issue.

A place to sleep is another aspect of physical comfort that is needed by visitors who come from a long distance or who want to keep constant watch over the patient. If the vigil goes around the clock, all the accessories and paraphernalia that goes with a comfortable resting place needs to be present. Although many visitors seem endlessly adaptable in their ability to sleep sitting up or on the floor in the waiting rooms, these adverse conditions are likely to add to their overall self-reported stress (Reizenstein and Grant, 1982; Simmons, Reizenstein, and Grant, 1982). Comfortable furnishings to sleep on, pillows and blankets provided by the hospital, etc. can greatly add to the visitors' comfort (Carpman, Grant, and Simmons, 1984).

## Privacy and Territoriality

The existing findings about visitors' concepts of privacy and territoriality are rudimentary. The mere presence of other people may reduce the freedom of choice if the individual cannot or will not carry out activities in the presence of others (Proshansky, Ittelson, and Rivlin, 1970). Holahan (1982) states that attaining personal privacy can be challenging. Visitor surveys in the PVP project studies (Reizenstein et al, 1981; Reizenstein and Grant, 1982) and visitors observed in a number of hospitals (Carpman and Grant 1984), request a degree of choice and control over social contact, particularly with regard to visual and acoustical privacy for conversations (Altman, 1975). Acoustical privacy was much desired in semi-private and multiple bed rooms, and this need was not limited to over-hearing of personal conversations. Medical conversations and conversations over the phone also required privacy. Edney and Buda (1976) point out that the concepts of privacy and territoriality appear intuitively to be related, especially when territoriality is used to enhance privacy, although the two are not identical. Achievement of privacy can help attain group order (Schwartz, 1968, Westin, 1967), information and interaction management (Laufer and Wolfe, 1974; 1977), self identity (Altman, 1975), and personal autonomy (Altman, 1975, Westin, 1967). Holahan and Slaikeu (1977) have shown that

lack of privacy in a therapeutic setting can negatively affect the rapport between a counsellor and a client. Reizenstein and Grant (1982) found that visitors in a waiting room often wished to discuss personal matters with other friends and family. Seating type and arrangement, as well as the presence of screening devices and sound absorbing material are likely to influence how private visitors feel in this setting.

Territoriality helps to organize and manage the daily lives of individuals and social groups (Holahan, 1982), and it helps develop and maintain social organization in accordance with the relative social status or dominance of group members. Territoriality also serves as a basis for the development of a sense of personal and group identity (Edney, 1976). In hospital settings, it has been suggested that visitor waiting areas need to be large enough so that several small groups can be seated together, somewhat separated from the other groups, and that operational policies and housekeeping practices should recognize the function of these small groupings and leave them in place, rather than returning all seats to some fixed location (Carpman and Grant, 1984). Untested but potentially useful approaches to providing a sense of territory for hospital visitors include providing coat storage in the waiting areas, making available to visitors

a place to change clothes, put on makeup, etc. (Reizenstein and Grant, 1981).

### Symbolic Meaning

Not much is known about the way a hospital is received symbolically by visitors but Shumaker and Reizenstein (1982) state that it has been well known as far as the patients are concerned that the image of the hospital's physical environment was one contributing factor to an overall impression of the hospital. This image plays a part in influencing how patients see themselves. Design can reflect the idea that a patient's or a visitor's needs are natural, anticipated, and important, or that these needs are deviant and unimportant. Using these available data, and extrapolating from their ideas to focus on the symbolic meaning of the hospital's physical environment for visitors, a positive symbolic message (that says that the hospitals have thought about the visitors, and planned for their needs or a negative message that acknowledges the visitors' presence but their needs were simply not of high priority) can determine visitor's satisfaction with the environment (Shumaker and Reizenstein, 1982).

There is another aspect of the symbolic meaning that must be examined. If it is assumed that aesthetics and function work in tandem, Shumaker and Reizenstein (1982)

describe a phenomena of unfulfilled environmental expectations when an usually attractive setting does not fulfill the expectations of a highly functional setting. Thus unfulfilled environmental expectations are involved where an environment is aesthetically pleasing but functions (or performs) poorly. A beautiful hospital lobby (or a waiting room) with sparse, uncomfortable seating is one example of this phenomenon.

#### CARPMAN'S GUIDELINES

In the book, Design That Cares (1986), Carpman, Grant, and Simmons have tried to fill the existing gap (of the unavailability of design-related information for hospital decision makers) by drawing upon information from the available resources (however limited) including published research, and primarily from the Patient and Visitor Participation (PVP) project studies conducted at the University of Michigan Hospitals. This book tries to bring together design-related needs and issues concerning patients and visitors and, in doing so, provide a basis for future inquiry and design.

The PVP project was a research and advocacy project that focused on the design-related needs of patients and visitors. Carpman and her associates started it as a part

of the design and planning process for the University of Michigan Hospitals Replacement program. It involved more than 3200 patients and visitors and more than 1200 staff members in 37 different studies of design issues.

Design That Cares talks about the various design-related issues that pertain to the patients and visitors. One such activity area discussed is the waiting space. In that discussion, behavioral issues involved in the designing of the waiting room and the satisfaction of the user (i.e. the visitor) were discussed side by side. Based on the end goal of visitor satisfaction, a checklist of guidelines was prepared. Carpman and her associates formulated these guidelines based on the available literature and, primarily, the PVP project studies. These criteria, based on activity spaces, design elements and amenities, and environmental factors (some of which were discussed on page 18), have been arranged into groups and are presented below. They are:

1. Waiting area (High-Stress)
  - a. Size and location
  - b. Related activities for visitors and patients
  - c. Seating arrangement
  - d. Seating comfort
  - e. Floor, wall covering, and lighting

2. Amenities (location, and needs, etc.)

- a. Place for family counselling
- b. Place for personal belongings
- c. Telephones
- d. Refreshments
- e. Rest rooms
- f. Clocks
- g. Smoking and non-smoking areas

Each criterion tries to evaluate the existing conditions or situation as part of an evaluation procedure, or provide some sort of a checklist for designers to be used during the design process. A waiting room that completely complies with the checklist should have, according to Carpman and her associates (1986), a high level of visitor satisfaction with the environment. Since these guidelines were developed on the basis of limited existing research and Carpman's own studies, they should be evaluated further using similar types of waiting areas in acute care hospitals, ranging in size (small to large) and regional context (urban to rural).

## Design Issues to be Evaluated

The evaluation of the proposed set of guidelines would enhance and extend their generalizeability. There are three main issues that need to be addressed as part of the evaluation:

1. How well do the waiting rooms conform to the design-related guidelines published by Carpman and her associates. Are the differences in the waiting room conformity to guidelines related to hospital size and locational context ?
2. Does the degree of conformity to the guidelines predict visitor stress in the waiting rooms ? If stress and waiting room characteristics are related, which are the more predictive design variables that determine stress in the waiting rooms ?
3. Does the degree of conformity to the guidelines predict visitor satisfaction with the waiting room ? If satisfaction and waiting room environmental characteristics are related, which are the more predictive design variables that determine satisfaction with the waiting rooms?

## Chapter Two

### METHOD

#### Setting and Sample Criteria

Ann Arbor, where Carpman's studies were conducted, is a university town with a high literacy rate and a high average per capite income (as compared to the nation's average). It is also an urban setting. The university hospitals in Ann Arbor tend to draw people from all around the state and beyond but within the region, and many who need complex medical procedures. Hence, the results of Carpman's studies may be based on a limited sample. To test the guidelines in an alternate setting, this thesis focused on the region in and around Kansas City (both Kansas and Missouri). This area was chosen for several reasons. First, this region has a great diversity in terms of rural to urban settings. It was also possible to select types of hospitals, based on their sizes, within the limited region. Second, the Kansas City area is different, geographically, from the Great Lakes region.

The names of hospitals within the region were extracted from the AHA Guide (American Hospital Association, 1987), which is a comprehensive guide to existing medical facilities, listed by state and by city. It also lists the type of facilities offered by each

individual hospitals. Only those hospitals that offered ICU facilities and were within a 50 mile radius (travel time one hour from the center of Kansas City) were include in the sample. This area contained counties that were urban, adjacent to urban, and rural. A final list of 24 hospitals was prepared and each hospital was individually contacted by letter. The letter explained the nature of study, the purpose, the importance, and how the hospital could benefit from it. A follow-up call to each of those hospitals was made to set up a convenient time the author could visit the facility and answer any questions that the hospital authorities wanted clarified. This strategy also enabled the researcher to see the facility.

Three hospitals declined to participate; eight hospitals did not acknowledge the initial letter, and two did not have a waiting area for the ICUs (a common occurrence among small sized hospitals). This narrowed the list of possible participants down to 11 hospitals (ranging from rural to urban, large to small). This sample included small and large hospitals, and also hospitals in rural, urban, and semi-urban settings. The first follow-up visit to each hospital was arranged to acquaint the researcher with the layout of the hospital and also to answer any questions the hospital authorities may have had regarding the research. This visit also gave the researcher a first

hand opportunity to observe informally various activities that were taking place in the waiting rooms.

## Instruments

### Assessment of Environments

These assessments were conducted in two stages, which were based on the three questions that are the focus of this research. The first part of the study tried to answer the question "How well do the waiting rooms conform to the design-related guidelines published by Carpman and her associates". In other words, it tried to assess the environment on the basis of a checklist provided within the guidelines. The guidelines have 57 questions directly related to high stress waiting areas as well as to general waiting. Several sections that pertained exclusively to general waiting areas were omitted to allow for consistencies among all hospitals (for example, the section on children; since most hospital policies do not allow for children in the high stress waiting areas unless a special situation demands it). As a matter of convenience, the checklist was sub-divided into 12 smaller sets of issues which the guidelines try to measure. These divisions were based on visitors' needs and design related issues. The two major categories that encompass the 12 issues are as follows : waiting areas (general and high stress), and

amenities (location and needs). A sample of questions taken from Carpman, Grant, and Simmons' book, Design That Cares, (1986), from each category follows.

#### Guidelines-based assessment of a waiting room

##### Waiting Area (General)

###### A. Size and Location

1. Has the waiting room been sized to allow approximately 15 net square feet per person during peak load period ?
2. Have waiting rooms been placed so that they are separate from the corridor but near a major circulation path ?
3. Can visitors and patients in the waiting rooms make visual contact with the receptionist ?
4. Can patients and visitors see into the waiting area before entering it ?

###### B. Related Activities

1. Where possible, have separate areas been created so that there is a quiet area for such activities as

reading, a moderate level activity area for TV watching, and a high level activity area for major circulation ?

2. Have interior and exterior windows been provided in the waiting area ?
3. If a TV is available, has it been installed so that its sound and view are screened off from the other activity areas in the waiting room ?
4. If a waiting room is too small to allow separate activity zone, has a TV been omitted ?

#### C. Seating Arrangements

1. Has seating been provided that enables people to arrange them-selves in different size social groups?
2. Does the seating enable people to position their bodies comfortably for conversation, with regard to both distance from one seat to another and the angle at which they face one another?
3. If a waiting area is likely to be visited by wheelchair users, have wheelchair spaces been provided among the seats?

#### D. Seating Comfort

1. Does the seating accommodate a wide range of users, including children, pregnant women, heavy or tall people, elderly people and the physically weak?
2. Has seating been provided that has backs and arms wherever possible, and that supports thighs and lower back, upper back and neck?
3. Has seating with sharp edges been avoided ?
4. Is the seating material comfortable, neither scratching users nor causing them to perspire?
5. To aid people in rising and sitting, has seating been provided that has firm support at the front edge, room for the sitter's feet to tuck under the front of the chair, and arms that extend out to or slightly past the front edge of the seat?
6. When seats are placed next to each other, have arm rests been used in order to give people a sense of separation from their neighbors?
7. Have couches and other furnishings that can be slept on comfortably been provided?

E. Flooring, Wall Covering, and Lighting

1. Has a non-skid floor surface been used?
2. Have flooring and ceiling materials been chosen that will help reduce noise?
3. Has lighting been installed that is intense enough for reading, yet not overly bright or glaring?
4. Has indirect or other "non-institutional" lighting been considered such as table lamps and recessed spotlights?
5. Has the interaction between lighting, flooring, and other surfaces been planned and arranged to avoid glare?
6. Have floor and wall colors been selected to contrast, thus helping people with poor vision?
7. Has lighting that produces excess heat been avoided?

F. Clocks

1. Are there clocks with easily read numbers?

G. Places for Personal Belongings

1. Do waiting areas contain tables, coat hooks, or other means for people to store their coats, purses, and other belongings?

H. Telephones

1. Are public telephones located outside the public waiting areas but close to them?
2. For ICU and other surgery waiting areas, are acoustically private public phones available inside or immediately outside the waiting rooms?
3. Are semi-enclosed public telephones provided in visitor waiting areas?
4. Are enclosed, handicapped -accessible booths provided in the main lobby?
5. Are there visual and acoustical barriers between semi-enclosed public telephones?
6. Has a writing shelf been provided near each phone?
7. Have lights, seats, and telephone books been provided whenever possible?

8. Have some public telephones been provided with amplifiers for the hearing impaired?
9. Has an intercom or a telephone connection been provided between the ICU nurse station and the family waiting room?

I. Other Amenities

1. Has an attractive display rack for magazines, brochures, and other written material been provided?

J. Refreshments

1. Are there vending machines, and water fountains close to the waiting areas?
2. Have vending machines been stocked with nutritious foods that have good eye appeal?
3. Are hot drinks such as coffee and tea available nearby?
4. Have trash receptacles been provided nearby?
5. Have water fountains been installed that can be used by children and wheelchair users?

K. Rest Rooms

1. Have entrances to rest rooms been placed so that they are entered from the hallway and not from the waiting room?
2. Do both men's and women's rest rooms contain unobstructed counter space sufficient for diapering a baby?
3. Have electrical outlets for electric shavers and hair dryers been provided?
4. Have clothes hooks been provided in each rest room?
5. Have public rest rooms been made wheelchair accessible whenever possible?
6. If space permits, has a comfortable chair been provided?

L. Smoking and non-smoking areas

1. If space is available, have separate smoking and non-smoking waiting areas been provided?
2. If separate waiting areas are not possible, has the option of assigning one or two special smoking

areas such as a hallway been considered?

3. If smoking occurs in general public areas, have special ventilation devices or partitions been installed?
4. Have smoking and non-smoking sections of public areas been designated?

M. High Stress Waiting

1. Have family waiting areas been located close to relevant units?
2. Have large waiting spaces that contain a sufficient number of separate family size " territories" been provided?
3. Have couches, chairs, and other furnishings been provided that enable family and friends to be physically close to one another?
4. Do the lighting, finishes, artwork, and accessories lend a warm,intimate, non-institutional feeling to the waiting area?

5. Is there a comfortable and private place for family members to grieve?

### Operational Definitions

This section provides the operational definitions of factors measured by the environmental assessment.

#### Visual Contact

To measure the possibility of a visual contact between the waiting room space and the reception desk, it must be physically established at site that the person officially in charge of supervising the waiting room can, while seated, look in the main waiting room, without having to readjust drastically his/her seating position or posture. Distance also matters in this case. It must be possible for the person to recognize individual visitors and see what they are doing. The receptionist or the staff person supervising the area must be able to observe most of the waiting area, and the seated occupants. Such a situation would allow the receptionist to notice whether anything is wrong or not or if anybody needed any assistance. However, the location of the desk should not seem as if it is invading the visitors' privacy.

#### Quiet level activity area

These are those areas in the waiting rooms that foster quiet activities such as reading, relaxing, taking a nap, etc. These are totally passive activities, and need acoustical privacy, screened off from environmental interferences such as smell, noise, movement, etc. These areas must be located out of the earshot of high level activity areas and away from the major circulation paths. This area must also have a variety of seating types including sofas that can recline to allow a user to take a nap comfortably. There also must be a control over the intensity of lighting, both natural or artificial. A reading lamp would be a definite advantage.

#### Moderate level activity area

Moderate activities include watching TV, or engaging in a conversation. In this case a moderate level of environmental intrusions are not unwelcome. This area should have a variety of seating types, flexible and light weight, and has the ability to form conversational groups. The lighting level is moderate to high, and can be manually controlled. Access to a window is generally appreciated and desirable.

#### High level activity area

High level activities involve inclusion of noise,

movement, and generally environmental intrusions are part of the accepted environment. This area is buffered, in relation with the other activity areas, by screens and other sound proofing materials. The activities in this area could include watching TV, or a major circulation path.

#### Social groups.

A group can be defined as a face to face aggregation of individuals who have some shared purpose for being together (Sommer, 1969). Group sizes can vary from a single person to a large sized family, but group sizes over 3 are rare. In the waiting room, it should be possible for small social groups to form by manipulating the environment. Hence the seats should not be heavy and immovable, should be comfortable, and should cater to all types of users (women, handicapped, etc.). A social group can effectively function if personal space rights of individual users are not violated, and if the persons engaged in conversation are seated at right angles to each other (Sommer, 1969). The nature of the seating arrangement should be more sociopetal (that which encourages social interaction) and not sociofugal (that which discourages social interaction).

#### Comfortable body positions for conversations

Briefly defined above, the way to measure the positions at which the body is under maximum comfort is by

observing the angle at which the seating is arranged. For effective conversation at a comfortable body position, the seats must be slightly tilted towards each other but must maintain the right distance (person to person distance of four to six feet) lest they violate the personal space of each other. A round table seating arrangement encourages cooperation and conversation which is good for conversation.

#### Wheelchair spaces

These are dimensions for accessibility of wheelchair users into the waiting room environment and to allow free movement. It should be possible for the wheelchair user to park any place without making any drastic change with the environment. The feeling of not being thought of or being unwanted should never be allowed to arise. A clear turning radius of five feet or more must be provided to enable the wheelchair to turn around. All standing spaces should allow a 2'-1" wide wheelchair to easily move in. All passages should be at least 3'-2" wide and all furniture should facilitate easy approach by the wheelchair. A removable hand rest on a sofa will let the wheelchair user make a more comfortable transition from the wheelchair to the sofa. Even spaces like the rest rooms should cater to the wheelchair users. People with other disabilities such as need to use crutches, bad eyesight, etc, also need to be

accommodated.

#### Comfortable seating material

Seating material should be comfortable to sit on and feel. It should not be made out of loose fibrous material that could scratch any exposed skin to produce itching and discomfort. The material should also not be synthetic in construction. Materials such as artificial leather, plastic, etc, do not let the body breathe and induce perspiration. An examination of the seating material will assess these qualities.

#### Non-skid floor

Smooth polished floor finishes such as marble, granite, terrazzo, or ceramic tiles, can be a source of accidents. Slippage, and skids can be the result from improper traction. A non-skid floor such as carpeting, cork tiles, brick tiles, or a wooden floor can be the best alternative, depending on the image the hospital wants to project. Non-skid surfaces like vinyl, linoleum, or PVC are also available but their value in terms of image created (the homey look) is very low (Building construction: Materials and type of construction).

#### Non-institutional lighting

Generally, bright, cool fluorescent lighting is

considered institutional, whereas indirect, warm fluorescent or incandescent lighting is friendlier, and thus, non-institutional. Fixtures such as table lamps, and reflectors are more non-institutional than the standard commercially available four -tube fluorescent hang-down boxes (Lighting Handbook by North American Philips Lighting Corporation, 1984.)

### Glare

Glare is any brightness that causes discomfort, interference with vision, or eye fatigue. It is brought about by :

- The brightness of the source,
- The size of the source: a large area of low brightness such as a luminous panel, or a number of low-bright luminaries, may be as uncomfortable as a single small source of bright light.
- Position of the source : Glare increases as the source is moved into the line of vision.
- Brightness contrast : The greater the brightness contrast between a source of glare and its surroundings, the greater the effect of glare.
- Time : A condition which is not objectionable for an exposure of a few minutes may become intensely uncomfortable and fatiguing to a person who must endure it for a longer period of time.

The assessment of the waiting room on the basis of glare will be based on the variables listed above. Environmental cues such as unshielded light sources (table lamps, light bulbs, ceiling panels,) unshaded windows (and with no possibility of control over the shading devices), shiny surfaces of the flooring material, table tops, walls, etc. may be supporters of glare. (Lighting Handbook by North American Philips Lighting Corporation, 1984)

#### Contrast in colors

The use of two colors at places where change in levels, difference in wall surface depths, or sharp corners occur, will ensure that the visually handicapped persons can negotiate the environment better. Contrasting colors are those that are located opposite to each other on the color chart. Red/green, blue/orange, and yellow/purple, are examples of contrasting colors.

#### Acoustically private telephones

Telephones need to be acoustically treated, both in terms of location and the immediate surroundings. In terms of location, the telephone should be located in an area that provides acoustical privacy. It should be handicapped accessible, distantly located from the major circulation path (but visible from it) preferably in the immediate vicinity of the waiting room, should have a direct

connection to the outside (not via a telephone operator),etc. The use of suspended ceilings with acoustical treatment directly above the telephone area can eliminate the travel of voice to a large distance.

#### Handicapped accessible telephones

If the telephone has been provided in a busy lounge, it is usually located in a booth. If this is the case, the booth has to be accessible to people who use wheelchairs, walk with canes, who are visually impaired, hard of hearing, who have arthritis, etc. If the telephone is located in an open area without the convenience of a booth, it must have all the acoustical precautions mentioned before. Besides these criteria, it must have large digits to help the visually impaired to read the numbers, it must have volume control to help the hard of hearing, a shoulder hold to help the person with arthritis, and several grab bars to give support to the weak person who needs canes or crutches for walking. There also must be a phone that is fixed at a lower height to facilitate use by a handicapped person in a wheelchair. If the telephone is located in a booth, the booth must be large enough to allow in a wheelchair. Graphics on the outside must denote the telephone's special purpose, which is for the use of handicapped persons.

Unobstructed counter-space in the rest rooms

For the purpose of activities directly related to hygiene and its ease in performance, counter space in the rest rooms should be larger than the conventional style. For activities like diapering a baby, changing clothes, putting on a makeup, etc, an extra length of counter space is required which is two to three feet more than the standard counter which only supports the sink. This counter space must be maintenance free and should not be coated with toxic compounds that could harm the human body.

Proximity in locating waiting areas to relevant units.

Waiting rooms for high stress departments such as the ICU should be located on the same floor as that of the ICU, located close enough to be approachable in a matter of a couple of minutes. It should be possible to approach the ICU either via the nurses' station or via a hallway with a limited number of turnings (decision points). The feeling of close proximity (just like being close to the bedside) to the ICU should be evident in the minds of the visitors.

Family size "territories"

The size, number, and style of the seats should allow flexibility and manipulation of the seating system to form various sized social groups (sizes ranging from 2 to 5 or more). This would allow families to manipulate the

environment and form small sized groups that could very well be their "territory" for the next few days. Props such as tables, screens, plants, niches and corners, carpets of various sizes, etc could help them demarcate the extent of their territories. A sense of safety and cohesion within the family unit may then be experienced. Personal belongings can be left within that "territory" without a lot of worry. Most of the props should be light-weight and flexible.

#### Private place to grieve

Private places to grieve should be remote from the main circulation paths, should have acoustical and visual privacy and should have comfortable seats. The furniture should include at least one couch that can be used by a person who is emotionally disturbed. It should have access to a rest room and a telephone. A room used for family-doctor consultation purposes may also be designated as a grieving room. The requirements, however, remain the same.

#### Peak load capacity of the waiting room

This is based on the total number of ICU beds (surgical and medical - if they share the same waiting room). It is the product of the number of ICU beds and the average size of the family that visits a patient in the ICU (a number that can be obtained from archival records). This

would give the peak capacity of the waiting room.

#### Assessment of Satisfaction Level with the Environment

In the second part of the research, each waiting room was individually assessed in terms of visitor satisfaction. This was measured by a questionnaire, developed by the researcher, which gathered data to determine the population characteristics (demographic) and the level of satisfaction experienced by the visitors with the waiting room environment (See Appendix A for the complete questionnaire). The respondents were assured that their identities would remain anonymous. A small sample of questions follows :

#### Demographic Information

1. Please indicate your sex :        ☐ Male        ☐ Female

2. Please indicate the number of family and friends  
(including yourself) who are visiting the patient in  
the Intensive Care Unit (ICU).

☐ 1        ☐ 2        ☐ 3        ☐ 4        ☐ 5 or more

3. Please indicate the number of hours per day, on an

average, you or your family have spent in this waiting room.

- ☐ less then two hours      ☐ 6-12 hours per day  
☐ 2-6 hours per day      ☐ more than 12 hours per day

### Satisfaction

1. Please indicate on the scale below, the amount of difficulty you had trying to find this waiting room the first time you came here.

[1]-----[2]-----[3]-----[4]-----[5]  
very      easy      neither easy      difficult      very  
easy                      nor difficult                      difficult

2. On the scale below, please indicate how you feel about the size of the waiting room.

[1]-----[2]-----[3]-----[4]-----[5]  
Very      small      neither small      big      very big  
small                      nor big

3. Do you find the seats in the waiting room comfortable or uncomfortable ?

--[1]-----[2]-----[3]-----[4]-----[5]-  
very      uncomfortable      neither      comfortable      very  
uncomfortable                      nor                      comfortable

4. Please indicate on the scale below. Overall, are you satisfied with this waiting room ?

--[1]-----[2]-----[3]-----[4]-----[5]-  
very      Satisfied      neither      unsatisfied      very  
satisfied                      nor                      unsatisfied

5. If any, are there things in this waiting room that you are unsatisfied with ? Are there things in this waiting room that you are satisfied with ?

### Procedure

This study was conducted in several sequentially ordered phases. The first part of the study evaluated the existing environment on the basis of the guidelines prepared by Carpman and her associates (1986), 1986). First, it was established with the hospital authorities that they had no plans to alter the waiting room environment during the course of the study, other than day to day maintenance. A request was made to the hospital administrators to make no changes to the environment for a period of one month. For the sake of continuity, photographs were taken during the first meeting to ensure that the environment was not altered.

The first part of the evaluation was conducted on a low use day, mostly during the week, to ensure minimum disturbance to the users of the waiting room. A floor plan of the unit was used to determine answers to some of the environmental questions ( for example, location of amenities such as rest rooms). This procedure helped fix the exact location of the waiting room vis a vis the main

corridor. A tape measure was used to determine the size of the waiting room, handicapped accessibility, etc. The operational definitions were utilized to measure the other variables such as comfort, and glare. The measuring tools were kept standard for all the hospitals. Most of the responses were based on a five point scale with the extremes being Yes/No and the mid point being neither/nor. Each hospital required a half day's time to complete the assessment of the environment.

The second part of the study evaluated the satisfaction of the visitors with the waiting room environment. It was hoped the sample size of responses would include at least 30 responses from each hospital. On the basis of talks held earlier with the hospital authorities, it was decided that the size of the questionnaire be limited to a single page (typed both sides). The questions were mostly "one word answer" types and it was assumed that it would take about two to three minutes to fill out each questionnaire. One or two open ended questions were included to let the visitor feel as an important part of an attempt to improve the waiting room. It was also decided to let the visitor fill the questionnaire on his/her own rather than involve the person in an interview. This would let the visitors answer the questions at their own convenience and the survey would not

be seen as an intrusion at a time of suffering and stress. A stack of questionnaires along with an introduction letter from the hospital was left in the waiting room and the visitors were expected to pick up a copy on their own initiative. The caretaker of the waiting room had instructions to only explain the purpose of the questionnaire, if asked, but under no circumstances should he or she help the visitor in filling out the questionnaire.

It was decided that the stack of questionnaires was to be left for a period of one month to maintain uniformity. Each questionnaire explained briefly the purpose of the exercise, and how important their view were to improve the waiting room environment. It was explained that their identity would remain anonymous and their position vis a vis the hospital would not be affected by their comments.

## Chapter 3.

### RESULTS

In this chapter, the modified process involved in collecting data and analyzing data will be discussed, and the data will be presented and discussed in terms of the three questions that formed the initial hypotheses for this research. Since most of the data from the individual questions in the questionnaire were in nominal form, it was necessary to convert them to a summary score for each dimension. These data from each dimension of the environmental evaluation, and for satisfaction will be first analyzed at the descriptive level. Individual analyses will be described and trends that are observed will be discussed. The analyses will examine differences, if any, in the conformity of waiting rooms to the guidelines and relate this conformity to the hospitals in terms of their sizes and locations. The chapter concludes with an examination of the degree of conformity of design variables to the guidelines and their ability to predict visitor satisfaction with the waiting room (through regression analyses involving the design and personal characteristics). The analyses will be followed by a section on general conclusions and a list of design recommendations to hospitals.

## Procedures Modified During Collection of Data

The hospitals were divided into a matrix based on their size and location. There was an unequal distribution of hospitals among all the sub-groups of the matrix, since less than 33% of the hospitals responded to the initial enquiries. The matrix of hospital size by location is shown in Table 1.

No hospital in the sample met the criteria for the sub-group "Large-Rural" (an infrequently occurring type). Although one potential participant met the criteria, the researcher failed to reach agreement on the scheduling of the research with the large federally supported hospital, and it declined to participate in the research. This happened during the second stage of familiarization and left 10 hospitals in the sample.

Since the staff of each hospital had already been made familiar with the questionnaire, only the method of collecting data was left to be explained when the researcher was on-site. Initially, as mentioned earlier, the questionnaires along with envelopes were left on a table or any place conveniently visible and obvious in the waiting room, and a notice was to be fixed alongside that would request the visitors to fill out a questionnaire at

their convenience. It was mentioned in an accompanying letter that the survey was being conducted with the full knowledge of the hospital authorities.

The second follow up visit to the hospitals, during data collection process, indicated that there were not as many responses to the survey as had been expected. It was discovered that several envelopes , mostly from the urban hospitals, were missing. It was decided that given the difficulty in obtaining responses using the planned procedures, the ICU nursing staff should be involved in administering the survey. With the knowledge and permission of the administration, the ICU staff was asked to encourage those visitors whom they felt were not too emotionally distressed or psychologically disturbed by the status of the patient to complete the questionnaire. This strategy increased the number of responses substantially. However, the total number of responses remained relatively low. In a final effort to increase the response rate, on the last weekend of the one month data-collection period, the researcher spent at least two hours in all the hospitals, in order to approach visitors about participating. In the end, the total number of responses obtained was 165. The breakdown of the responses by hospital was as shown in the Table 2.

Table 1.

Hospital Matrix of Size and Location

<u>SIZE</u>	<u>URBAN</u>	<u>SUBURBAN</u>	<u>RURAL</u>
<u>LARGE</u>	1,2,3	4,5,6	**
<u>SMALL</u>	7	8,9	10

Table 2.

Number of Responses per Hospital

Hospital 1	:	15	Large/Urban
Hospital 2	:	26	Large/Urban
Hospital 3	:	18	Large/Urban
Hospital 4	:	11	Large/Semi-Urban
Hospital 5	:	16	Large/Semi-urban
Hospital 6	:	14	Large/Semi-Urban
Hospital 7	:	18	Small/Urban
Hospital 8	:	29	Small/Sub-Urban
Hospital 9	:	10	Small/Semi-Urban
Hospital 10	:	8	Small/Rural

## Data Analyses

The KSU's SPSS system, version H, release 9.1, was used to analyze the data collected. As stated earlier, a descriptive level analyses (distribution of data, degree of conformity, etc.) were performed on the data collected. The first set of analyses compared the degree of conformity of each waiting room to the guidelines. As the next part of the analyses, satisfaction scores were analyzed to examine the predictive value of some of the environmental features. The variables used for these analyses included population demographics (for example, sex of the respondents, age of the respondents, distance travelled from home to hospital.), and environmental characteristics of the waiting rooms.

### A Discussion on Waiting Room Conformity to the Guidelines (Individual Scales).

In this section, waiting room conformity to the guidelines is discussed according to the size and location of each hospital. Each scale will be represented by a figure that shows the pattern of conformity to that scale by all the ten hospitals. An overall view of all the hospitals' conformity patterns is presented in Figures 14 and 15 at the end of this section.

Scale A : Waiting room size and location.

In this scale, the main issues that determined the level of conformity include the suggested size of waiting room per person, location of the waiting room vis a vis the main corridor, and the ability to preview the waiting room before entering it. Figure 1 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of the rooms size and location in the hospital.

Five hospitals (2, 4, 5, 6, and 8) were in 100% conformity whereas Hospitals 1, 9, and 10 were in 50 % conformity. Hospital 7 had the lowest conformity rating, 25 %. Hospital 3 was in 75 % conformity. On the whole, large, suburban hospitals were higher in conformity. The small, urban hospital 7 fared poorly, as the waiting room was located at the far end of the corridor where no other functional space could be justified. Most of the low conforming waiting rooms did not have a previewing ability.

Scale B : Allowing for related activities

Using this scale, the waiting room was judged based on whether several activities such as reading, or TV watching had been provided for, and how effective the provisions were. Figure 2 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of allowing for related activities.

In this case, hospitals in the urban area were between 33% to 100% conformity. Hospital 2 was in 100% conformity, whereas, Hospital 1 was in 33% conformity. This hospital lacked interior windows for pre-viewing purposes. The TV was installed in such a way that would disturb other activities in the room. The large sub-urban hospitals fared poorly, varying between 80% conformity (Hospital 4) and 20% conformity (Hospital 5). Hospital 5 had no exterior or interior windows, and the TV was installed in a such a way that would disturb other activities in the room. The small urban Hospital 7 was also low in conformity, about 20%, for mostly the same reasons. The lack of conformity may result from the fact that some of these activities such as separate TV watching space require substantial floor area, a commodity hard to obtain in a small urban hospital. Hospital 8, and 9 (small, suburban) varied greatly in their levels of conformity. Hospital 8 was in 66% conformity as compared to Hospital 9 which had no conformity. The rural Hospital 10 was in 66% conformity, a fairly high level, but expected of because of the location. It is interesting to note that the large-urban hospitals seemed better able to provide facilities, and cater to various needs of the visitors.

The large suburban hospitals, on the other hand despite large areas under their control, could do no better

in conformity ratings than the smaller hospitals. Hospital 4 was the only one that could take care of these requirements for activities. It is no surprise that the rural hospital 10 has almost 66% conformity.

#### Scale C : Seating arrangements

In this scale, the waiting room was rated according to the type of seating arrangements that were possible in the space. Some of the issues included the possibility to arrange the seating into conversation groups, wheelchair accessibility, and body angles for comfortable conversation. Figure 3 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of the seating arrangements. Hospitals 1, 4, 5, and 10 were in 100% conformity. Hospitals 3, 6, 7, and 8 were in 33% conformity. Hospital 10 was the lowest with no conformity. Hospital 2 was in 66% conformity. Most of the hospitals did not conform to the guideline of allowing wheelchair accessibility. Hospital 10 (small, rural) had chairs that were lined up against the wall in a military fashion.

#### Scale D : Seating comfort

This scale is a follow up of the previous Scale C. In this scale, the issues of seating comfort are used to determine the conformity level to the scale. Issues such as accommodating a variety of users, providing arms and back

Figure 1

Degree of waiting room conformity to the guidelines in terms of its size and location.

## Conformity to Size & Location

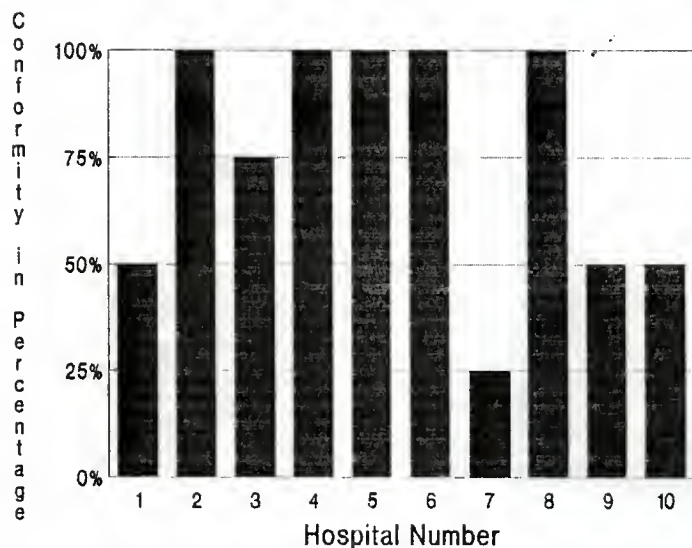


Figure 1: Scale A- Degree of Waiting Room Conformity with the Guidelines in terms of its Size and Location.

Figure 2

Degree of waiting room conformity to the guidelines in terms of allowing for related activities.

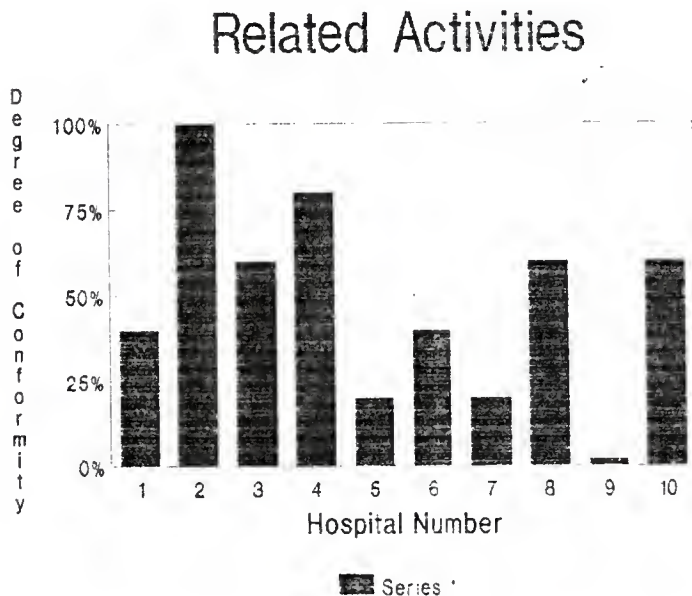


Figure 2 . Scale B- Degree of Waiting Room Conformity to the Guidelines in terms of Allowing Related Activities

support to seats, avoiding sharp edges, use of comfortable material, and provision of couches/sleeper sofas are included in this scale. Figure 4 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of seating comfort. The range of seating in waiting rooms varied from 50% conformity to 100% conformity. Hospital 4, 6, and 9 were in 100% conformity. Hospitals 2 and 7 were in only 59% conformity. In most of the instances, the quality of material used was scratchy and artificially made. The seats did not provide ample support to the back or the thigh. Some hospitals did not provide couches or sleeper sofas to enable long time visitors to sleep.

Scale E : Flooring, wall covering, and lighting quality.

This scale addresses conformity to design guidelines on the issues of flooring, wall covering, and lighting quality. The issues cover glare-free walls and flooring, sound insulation possibilities, non-skid floors, non-institutional lighting systems, contrasting floor and walls, and avoidance of heat producing lights. Many hospital interiors have changed in recent years from the typical institutionalized waiting room to attempts at "casual" or "homey" interior finishes. Most hospitals in the sample, except 7 and 10, had a high conformity rating (75% or better), with five of them achieving 100%

conformity. Figure 5 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of flooring, wall covering, and lighting quality.

Hospital 7 was in 25% conformity and hospital 10 in 33% conformity. The Hospital 7 waiting room (small urban) was small in area with a large TV which would have proven to be a sound nuisance to the rest of the room. The interior finishes were also very institutional. Perhaps reflecting the noise level and finishes, its average overall visitor satisfaction rating was relatively low. The rural Hospital 10 followed a similar pattern. Less attention apparently had been given to the attractiveness and the quality of the interior items (including the flooring). But, despite this, the average overall satisfaction rating in this rural hospital was high. The difference could be due to a disparity in social attitudes. Users in the urban areas may expect more in return for their money whereas the rural users may be less bothered about the interior finishes. It could also be that the friendly staff in the rural hospital made up for what was lacking in the physical environment of the physical environment of the waiting room.

Figure 3

Degree of waiting room conformity with the guidelines in terms of seating arrangements.

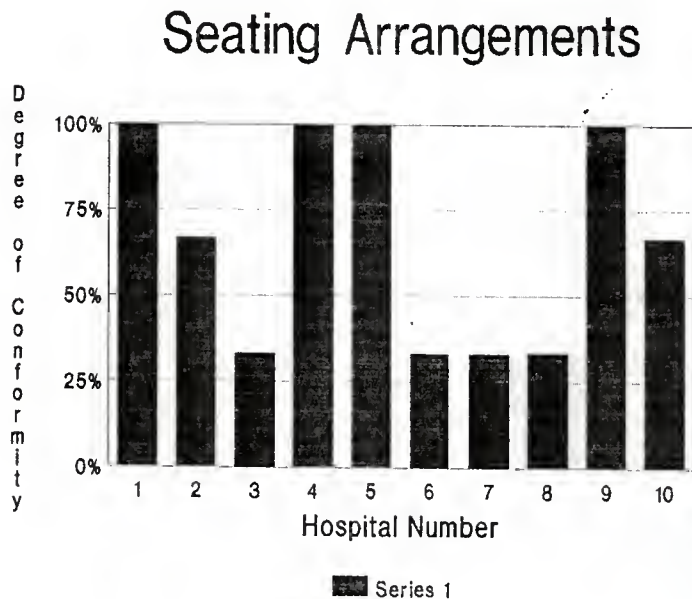


Figure 3: Scale C- Degree of Waiting Conformity to the Guidelines in Terms of Seating Arrangements.

Figure 4

Degree of waiting room conformity with the guidelines in terms of seating comfort.

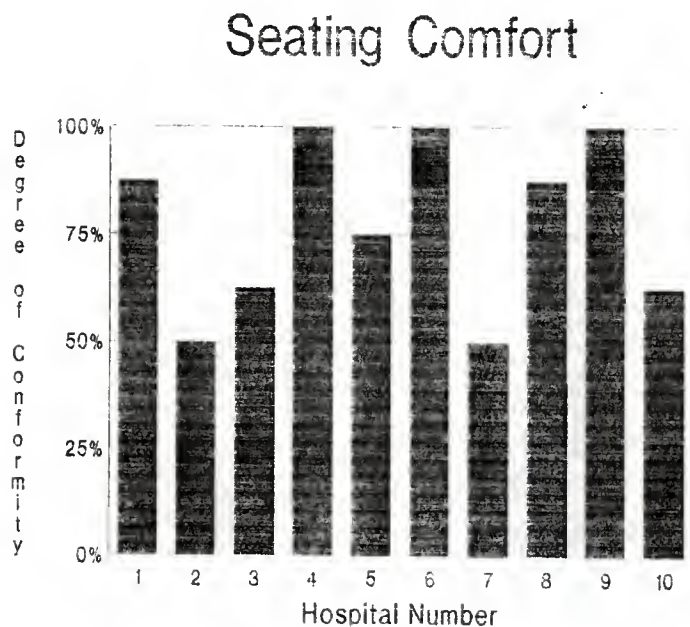


Figure 4 : Scale D- Degree of Waiting  
Conformity to the Guidelines in Terms  
of Seating Comfort.

Scale F : Presence of an easily read wall-clock

It is very important to have a legible clock (from all angles in the waiting room) that is glare and reflection free. Figure 6 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of the presence of an easily read wall clock. Only 6 of the 10 hospitals (4, 5, 6, 7, 8, and 9) had 100% conformity. None of the large urban hospitals and nor did the rural hospital conformed to the guidelines.

Scale G : Providing place for personal belongings

This scale assesses the provision of a properly maintained and secure place for personal belongings. As shown in Figure 7, eight out of ten waiting rooms did not conform to the guidelines and had no such place or designated area. Most visitors had to use chairs or the floor to store their personal belongings. Sometimes the tables meant for other purposes were utilized for that purpose. Another major item that was missing was a clothes hanger/rack to hang visitors' coats or changes of clothing. Only Hospitals 2 and 9 had made provisions for this activity.

Scale H : Telephone amenities.

This scale, which assessed the convenience of adequate telephone amenities to the users, had nine

criteria to be satisfied . These included location of telephones, handicapped and hearing impaired useability, provision of lights, shelves, seats, privacy, and provision of a telephone line between the waiting room and the ICU. Most hospitals had a low rate of conformity, on the average about 25%. As Figure 8 indicates, only two hospitals were above 50% - Hospitals 2 and 4. Hospital 2 was close to 100%. In most cases, telephones for the handicapped and the hard of hearing had been omitted. Even the basic requirement of privacy often had been neglected, and in some cases, some kind of a seat or a chair was not even present. Items to support activities such as writing or reading the telephone directory (providing a strong light) typically had been neglected as well.

Scale I : Attractive display rack.

This scale assessed the provision of attractive racks to display reading and informational material. Most hospitals (8 out of 10) relied on the same form of displaying magazines, which was by placing them on the TV or on a center table. This produced abused books, misplaced magazines, and missing literature. Figure 9 shows the conformity level of each hospital ICU waiting room, with the guidelines in terms of providing an attractive reading and information display rack. Surprisingly, Hospital 3, which had a low conformity rating on most other scales, did

Figure 5

Degree of waiting room conformity with the guidelines in terms of flooring, wall covering and lighting quality.

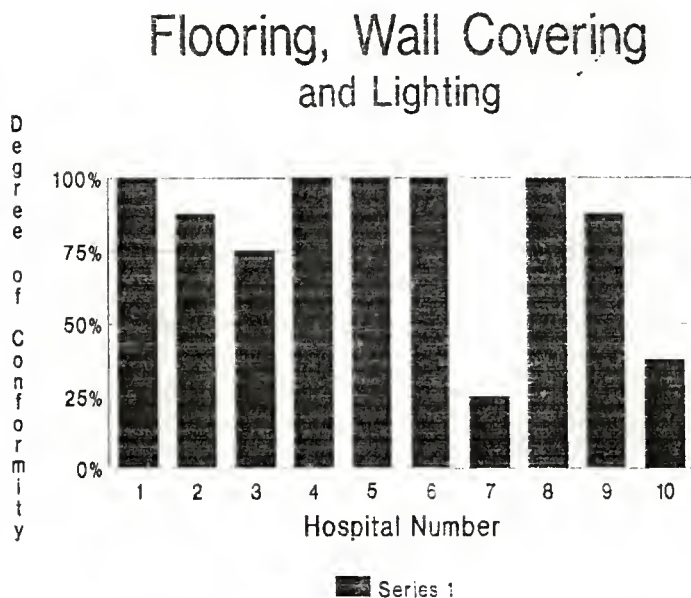


Figure 5 : Scale E- Degree of Waiting Room Conformity to Guidelines in terms of Flooring, Wall Covering & Lighting.

Figure 6

Degree of waiting room conformity with the guidelines in terms of presence of an easily read wall clock

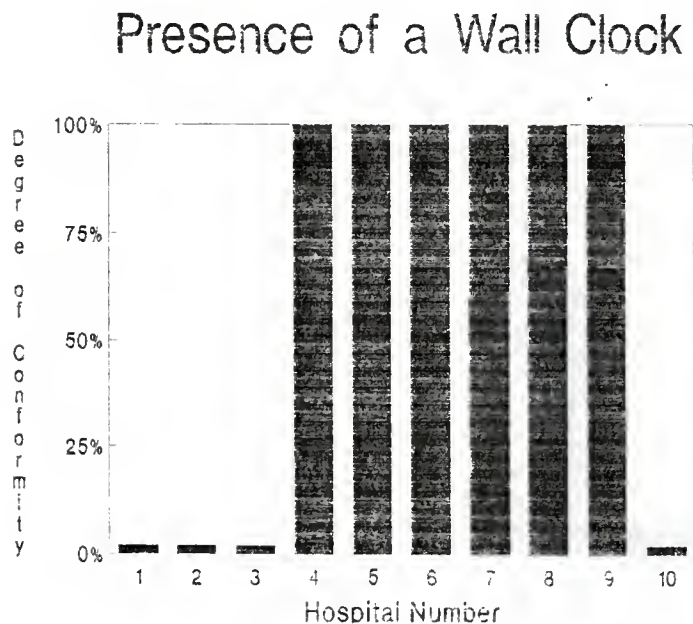


Figure 6 Scale F- Degree of Waiting Room Conformity to Guideline in Terms of Providing an Easily Read Wall Clock

provide an attractive rack for this purpose. Hospital #1, another large urban hospital, also conformed to the criteria.

#### Scale J : Quality refreshments

This scale addressed issues pertaining to provision of quality refreshments. Some of those issues included provision of vending machines with quality food, hot drinks, water fountains which were handicapped accessible, and trash receptacles. Figure 10 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of providing quality refreshments nearby. The range of conformity varied from 33% to 87%. Hospitals 3, 4, 6, 7, 9, and 10 were in 66% conformity, Hospitals 2 and 5 were in 87% conformity. Hospitals 1 and 8 were in 33% conformity. Most hospitals had vending machines or cafeterias on a different floor or too far away. Most of the cafeterias closed after the evening visiting hours, thus depriving the ICU visitors of refreshments at late hours. Some hospitals did not have a handicapped accessible water fountain.

#### Scale K : Rest room amenities

This scale covered the issues pertaining to rest room amenities. Those issues that determine conformity included location of rest rooms, provision of counterspace,

Figure 7

Degree of waiting room conformity with the guidelines in terms of providing place for personal belongings.

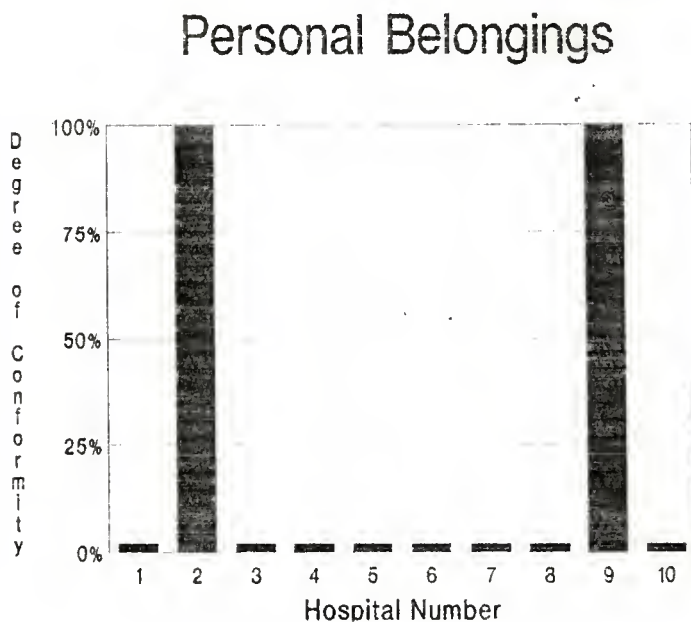


Figure 7 : Scale G-Degree of Waiting Room Conformity with Guidelines in Terms of Places for Personal Belongings.

Figure 8

Degree of waiting room conformity with the guidelines in terms of telephone convenience.

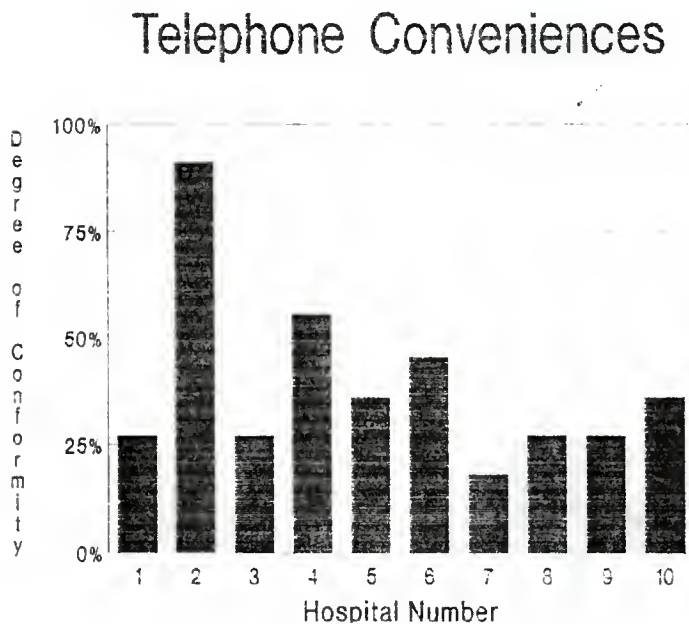


Figure 8 Scale H- Degree of Waiting Room Conformity with Guidelines in Terms of Telephone Conveniences.

electrical outlets, clothes hooks, and wheelchair accessibility. The overall conformity for all the hospitals was low. Figure 11 shows the conformity level of each hospital ICU waiting room with the guidelines in terms of providing adequate restroom facilities. Hospitals 2, 6, 7, 9, and 10 were 66% in conformity. Hospital 5, at 87% conformity was the highest. Hospitals 3 and 7 were in 33% conformity whereas Hospital 4 was the lowest at 16% conformity. Most rest rooms did not have counter space or additional electrical outlets. Hospital 4 (large, semi-rural) did not have clothes hooks and was not wheelchair accessible. Overall, the smaller hospital types did much better than the large hospitals on this scale.

Scale L : Smoking and non-smoking areas.

This scale assessed the possibility of differentiating smoking from non-smoking areas. It included issues such as separation of smoking and non-smoking areas, and use of ventilating devices in smoking sections. With the growing awareness of the harmful effects of smoking, more and more public agencies have started to relegate smoking to certain specified areas as a choice. Hospitals have followed suit (for a variety of health and contamination reasons); some have prohibited smoking outright, and others have provided separate areas for this purpose. Figure 12 displays the conformity level of each

Figure 9

Degree of waiting room conformity with the guidelines in terms of providing reading and information display racks.

## Display Rack for Information

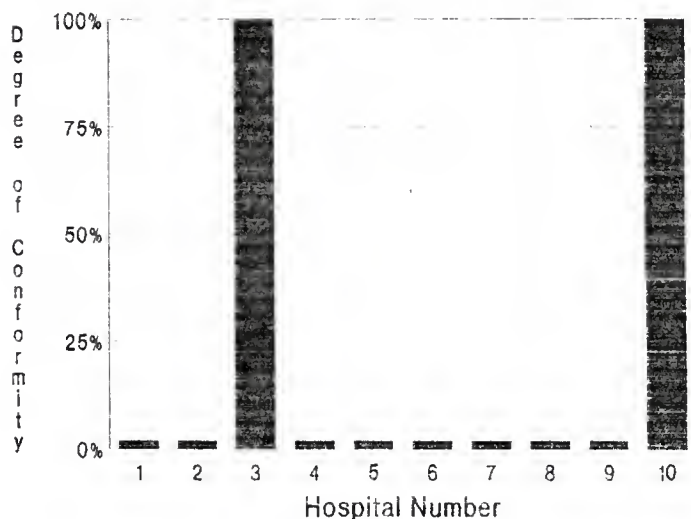


Figure 9 : Scale I- Degree of Waiting Room Conformity to Guidelines in Terms of Providing an attractive display rack.

hospital ICU waiting room with the guidelines in terms of differentiating between smoking and non-smoking areas. Four hospitals (1, 2, 3 : all large urban hospitals, and 10, a rural hospital) had 100% conformity. Evidently, the provision of non-smoking areas is growing in the urban areas faster than the suburban areas. Only two hospitals (one small, urban and one small, suburban) had 25% conformity. By totally banning smoking, Hospital 9 had taken away the choice factor from the visitor. Most of the other hospitals were 75% or better in conformity.

Scale M : Other attributes of high-stress waiting.

This scale addressed various attributes particularly relevant to high stress waiting. Some of those attributes included separate family-sized territories, a grieving place for families, proximity, and ability to keep families and friends close together in groups. Figure 13 displays the conformity level of each hospital ICU waiting room with the guidelines in terms of other various attributes of high stress waiting. The overall conformity level was high except for Hospital 7. Hospitals 5 and 9 were 100% in conformity, while Hospital 7 was in less than 25% conformity. Two hospitals, 1 and 4, were more than 75% in conformity, and the four others - 2, 3, 6, and 8 were above 66% in conformity. The rural hospital 10 was less than 50% in conformity. There does not seem to be any definite

Figure 10

Degree of waiting room conformity to the guidelines in terms of providing quality refreshments.

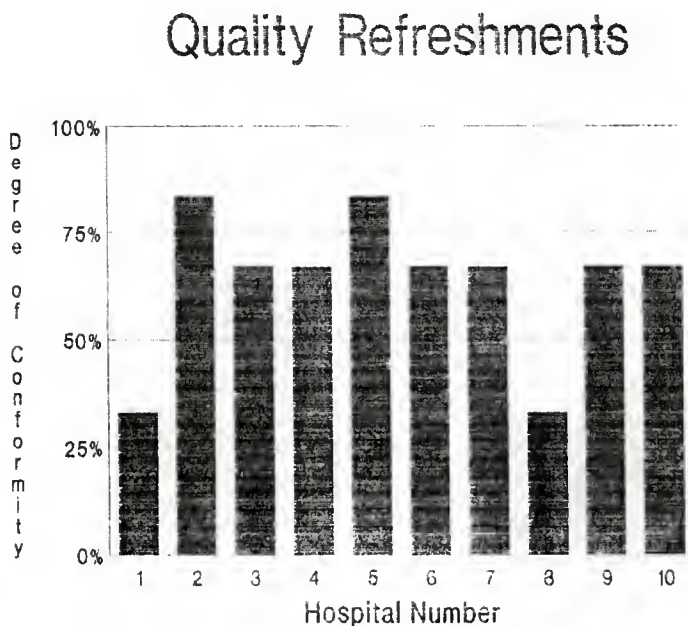


Figure 10: Scale J- Degree of Waiting Room Conformity with Guidelines in Terms of Providing Quality Refreshments.

Figure 11

Degree of waiting room conformity with the guidelines in terms of providing rest room amenities.

## Rest Room Amenities

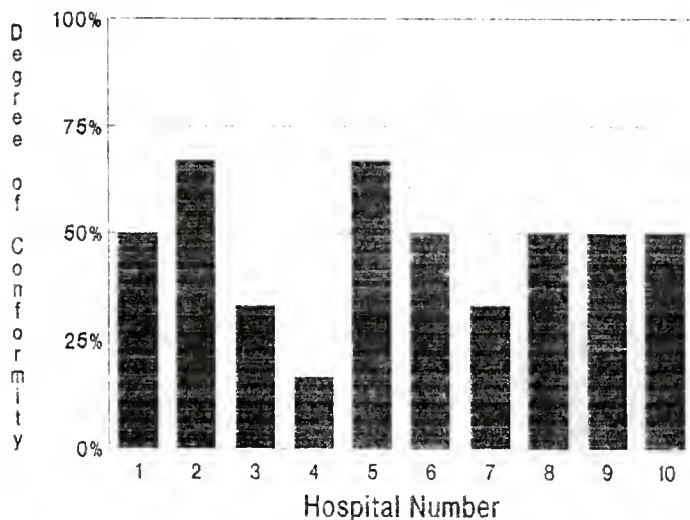


Figure 11: Scale K- degree of Waiting Room Conformity with Guidelines in Terms of Providing Rest Room Amenities.

pattern except that the urban hospitals were more in conformity than the others.

Figures 14 and 15 summarize the conformity for all scales across the 10 hospitals. Overall, though the conformity pattern was erratic with no definite trend noticed, the semi-urban hospitals tended to have a lower conformity to the guidelines. This could be due to the nature of users the hospitals serve (expectancy for quality amenities may be low amongst the suburban users?). It was noticed, as evident from Figures 14 and 15 that overall, Hospitals 1 (large, urban), 6 (large, semi-urban), 7 (small, urban), 8 (small, semi-urban), and 10 (small, rural) were low in conformity to most of the scales of the guidelines and Hospitals 2 (large, urban), 4 and 5 (large, semi-urban), and 9 (small, semi-urban) were high in conformity to most of the scales of the guidelines. Figure 12 : Degree of waiting room conformity with the guidelines in terms of differentiating between smoking and non-smoking areas.

Figure 12

Degree of Waiting Room Conformity with the Guidelines in Differentiating Between Smoking and Non-smoking areas.

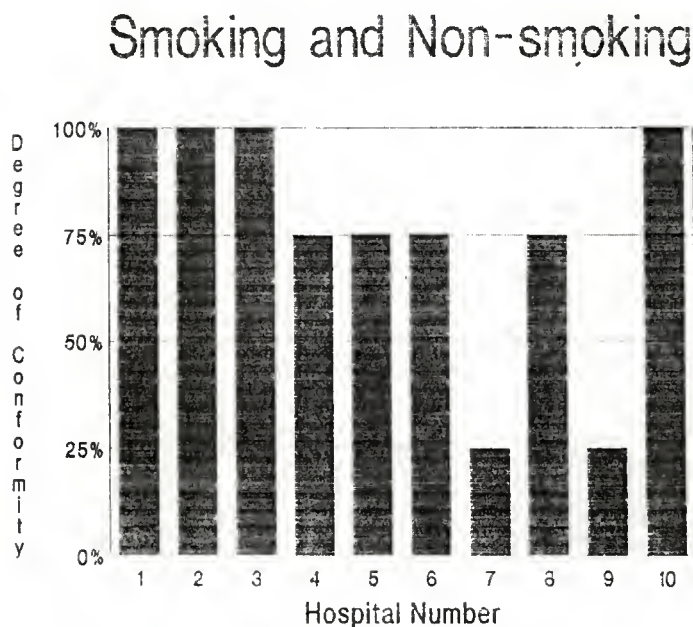


Figure 12: Scale L- Degree of Waiting Room Conformity to Guidelines in Terms of Differentiating Smoking/Non-smoking.

Figure 13

Degree of waiting room conformity with the guidelines in terms of various attributes of high stress waiting.

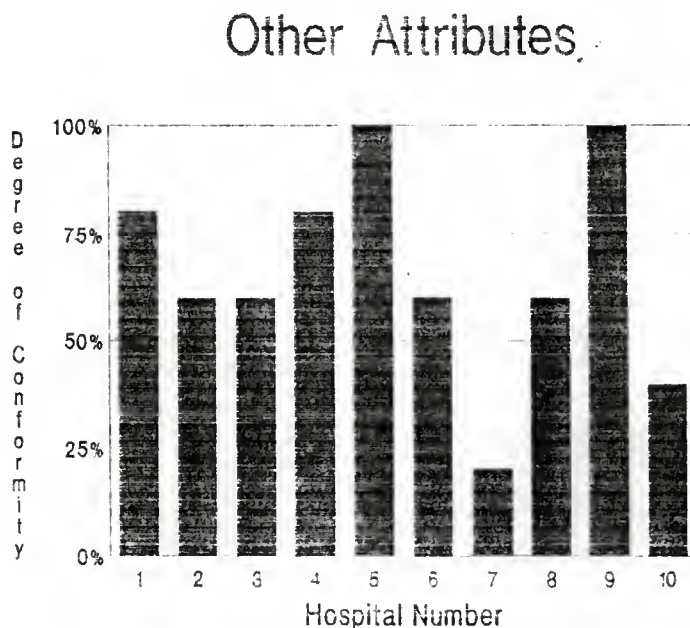


Figure 13: Scale M- Degree of Waiting Room Conformity with Guidelines in Terms of Other Attributes of High Stress Wait.

There were some scales, such as allowing for related activities, where most of the conformities were around 50% or below. Similarly, hospitals tended to fail to provide places for personal belongings (eight out of ten hospitals had no conformity), telephone conveniences (all hospitals except one were about 50% or less in conformity), and an attractive display rack for magazines (eight out of ten hospitals had no conformity). On the other hand, scales such as conformity in terms of size and location (six out of ten hospitals had more than 75% conformity), seating comfort (eight out of ten hospitals had 66% or more conformity), flooring, wall covering, and lighting (eight out of ten hospitals had 75% or more conformity), quality refreshments (eight out of ten hospitals had 66% or more conformity), and differentiating between smoking and non-smoking areas (eight out of ten hospitals had 75% or more conformity) were overall in high conformity.

Figure 14

Overall conformity pattern to the design guidelines for each hospital (Scales A to G).

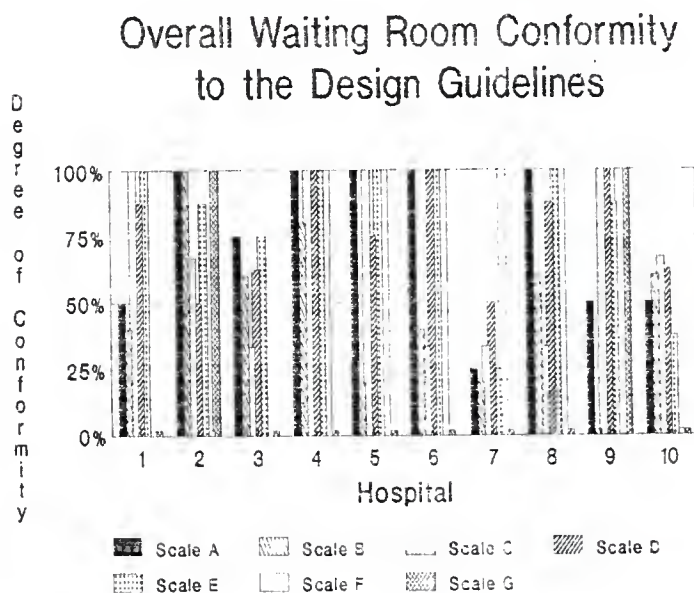


Figure 1: Overall Waiting Room Conformity Pattern to the Design Guidelines.

Figure 15

Overall conformity pattern to the design guidelines for each hospital (Scale H to M).

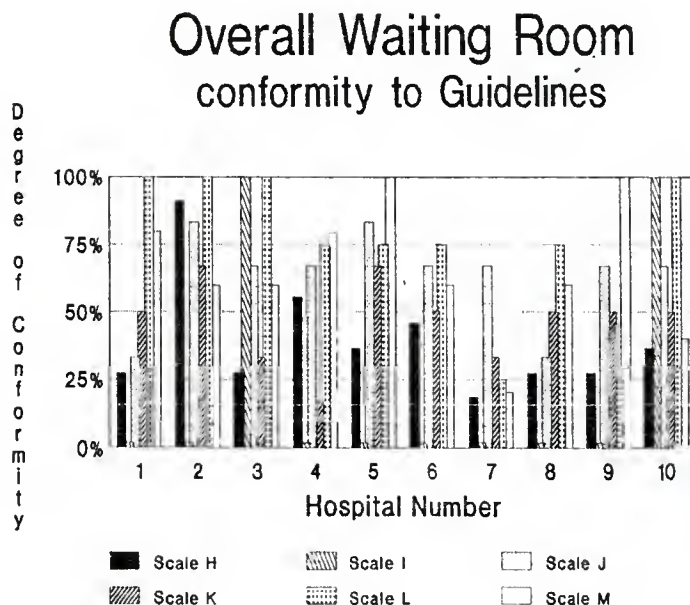


Figure 14 : Overall Waiting Room  
Conformity Pattern to the Guidelines

## Description and Discussion of Survey Responses by Hospital ICU Waiting Rooms

In the following pages, the data collected are presented in figures that show the pattern of distribution for each of the responses in the survey questionnaire for each hospital. The first section profiles the characteristics of the respondents in terms of age, gender, number of persons in the group who were waiting, the amount of time the person had spent in the waiting room, and the distance travelled from home to the hospital. This background information on the responses provides a context within which interpretation to their responses to the waiting room environment can be made.

### Gender Distribution

From the data collected, the gender distributions of the visitors to the ICU waiting rooms shown in Table 3 were observed. Clearly, the preponderance of visitors in all hospitals were females, with the ratios ranging from 3:2 to 7:1. No significant differences were evident in male/female ratios for hospitals based on size or location. The suburban hospitals, though, show a slight tendency to attract a larger proportion of males as compared to any other location.

Table 3.

Male/Female distribution per hospital.

HOSPITAL	TYPE	FEMALE (%)	MALE (%)
Hospital 1	L,U	80	20
Hospital 2	L,U	84.6	15.4
Hospital 3	L,U	87	13
Hospital 4	L,SU	81.8	18.2
Hospital 5	L,SU	68.7	31.3
Hospital 6	L,SU	85.7	14.3
Hospital 7	S,U	61.1	38.9
Hospital 8	S,SU	79.3	20.7
Hospital 9	S,SU	70	30
Hospital 10	S,R	87.5	12.5

#### Age Distribution.

In the questionnaire, the visitors also were asked to indicate the age group to which they belonged. Figure 16 describes the average age distribution of visitors according to each hospital. The average age ranged from about 30 years (in the case of hospital 10 - a small, rural hospital) to 49 years (for hospitals eight and nine - both small, semi-rural hospitals). The average age for most of the hospitals was about 35-40 years. The overall responses showed the distribution of the range of ages from less than 20 to over 65 years. These data can help designers and administrators plan the waiting area to cater to a certain age group more specifically than the others (designing lighting levels, providing a certain category of reading literature, and maintaining a desired level of audio intensity of the public address system).

#### Average number of visitors per patient.

The visitor was asked to indicate the number of visitors/family members (including himself/herself) who were visiting the patient. Figure 17 shows the average number of persons in the visiting group per patient. It was observed that the rural Hospital 10 had the highest number of visitors per patient - close to 5. The reason most often given by the staff was the fact that the hospital served a local community, and friends and family members could

Figure 16

Average age distribution of visitors in the ICU waiting room.

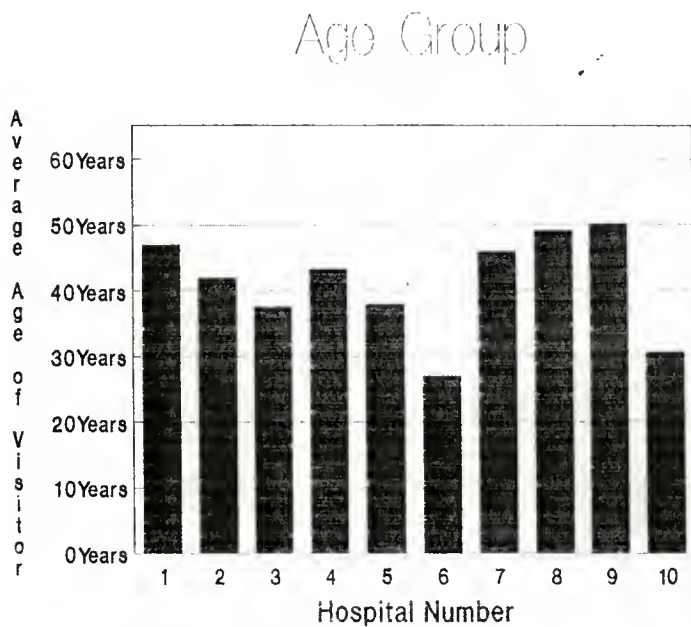


Figure 16: Average Age Distribution of Visitors in ICU Waiting Areas for Each Hospital.

easily attend due to the low distance, as will be discussed later in the section on distance from the hospital. The lowest number of visitors per patient was in Hospital 7, a small urban hospital. The reason for this low attendance could be the insufficient amenities available to the visitors. The staff was not able provide any reason for this small group size.

Average time spent in the waiting room.

Since it is possible that the length of stay in the waiting room may make the presence or absence of amenities and appropriate design a more critical issue, respondents were asked to indicate the number of days they had spent at least some time in the waiting room. Figure 18 describes the distribution for each hospital. On the average, the visitor spent 3.5 days in the small-urban hospital, amongst the lowest for all the hospitals. It may be that if a hospital in an urban situation is limited in facilities for visitors, the visitors spend the least possible number of days, and visit the patient in lesser numbers. It may also be that patients remained in the ICU for shorter periods of time, since extremely critical cases might be transferred to larger urban hospital. At the other extreme, the rural hospital 10, where the average number of days spent in the waiting room were 5 or more per visitor, also had the most number of visitor per patient. Once again, the reason could

Figure 17

Average number of family/visitors per patient in the ICU  
for each hospital.

## Visitors/Patient in Waiting Room

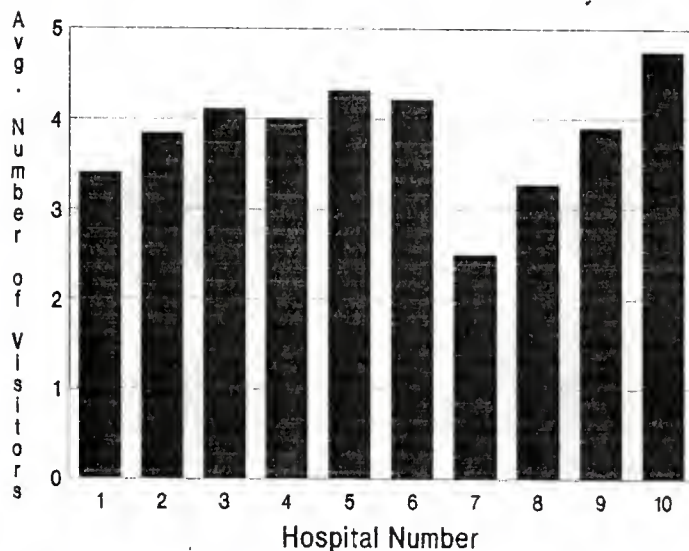


Figure 17. Average Number of Visitors  
per Patient in Each Hospital ICU

Figure 18

Average number of days visitors spent at least some time in the ICU waiting room.

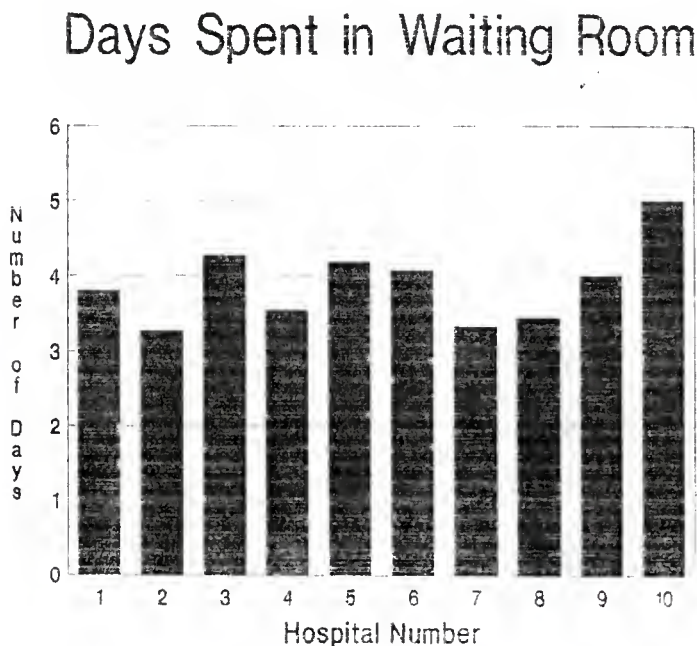


Figure 18 - Average Number of Days Spent in the Waiting Room

be a matter of convenience, and perhaps less dependence on amenities and resources provided by the hospital.

Distance travelled by visitors from home to hospital.

Figure 19 displays the average distance the visitor drove/travelled from home to the hospital, for each hospital. The average distance travelled to a rural hospital was the lowest amongst all the hospitals, around 10 miles. Apparently, a rural ICU tends to serve a local community, and is more likely to receive a higher number of visitors per patient and who are more likely to spend more time in that waiting room. In the course of informal discussions, it was revealed by the nursing staff that since the residents of the area were usually well known, it was very likely that individual members of the patients family would be summoned from their homes in times of immediate need. The largest distance travelled was in a large, semi-urban, teaching hospital. This could be attributed to the hospitals widespread reputation and academic standings; hence, people from greater distance might tend to seek treatment there.

The large-urban hospitals showed close to average distributions of all the personal demographic characteristics of the visitors. Among the hospitals surveyed, the average number of family members ranged from

Figure 19

Average distance travelled by visitors to reach hospital.

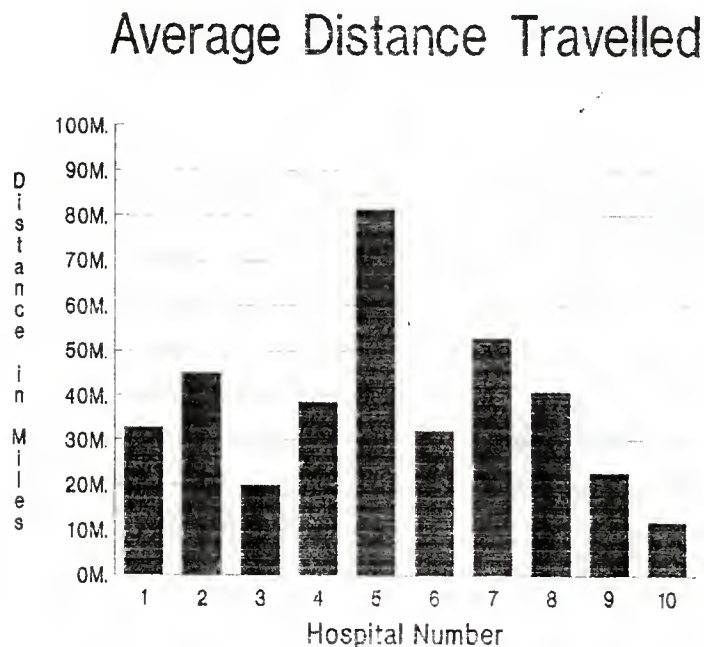


Figure 19 Average Distance Travelled to Reach Hospital

3 to 4, and the average number of days spent at the waiting room also ranged from 3 to 4 days. The distance travelled on the average was more than the rural hospital, usually between 15 and 50 miles. In the case of the large-semi-urban hospital as the location suggests, hospital 5 had an above average number of visitors per patient (4.4), and the average number of days spent in the waiting room was also above average. This hospital, perhaps for academic purposes, admitted only severe cases in the ICU, and the severity of patients' illnesses may have required family members to spend additional days, on an average, in the waiting room.

#### Aspects of Satisfaction with Waiting Room

In this section, the average overall visitor satisfaction is analyzed. The other visitor responses particularly those pertaining to seating comfort, location of food services, restroom facilities, distance between waiting room and ICU, privacy, and perceived stress have been discussed and compared with the corresponding conformity to the guidelines scales as shown in Table 4.

#### Overall Visitor Dissatisfaction with Waiting Room.

The visitors were asked to indicate their overall satisfaction with the waiting room. Figure 20 shows the

average overall visitor dissatisfaction with the waiting room distributed by each hospital. Respondents in all hospitals reported a range from very satisfied to very unsatisfied. The three large-urban hospitals had mean responses varying from an average level of satisfaction to slightly above satisfied. Comparing these ratings with the distribution pattern of conformity to the guidelines (refer to Figures 1 to 13 ), where the average conformity varied from 33% to almost 90%, this varied conformity to the design guidelines could be the reason for an average level satisfaction among the population of visitors to the waiting room. One large-semi-urban hospital and one small-urban hospital had below average satisfaction ratings.

The highest rate of satisfaction was with Hospital 9 : a small, semi-urban hospital. Overall, the rural Hospital 10 was closer to the satisfaction level, and Hospital 9 was rated in between satisfactory and very satisfactory. Comparing within the small hospitals, the small-rural hospital did better. It is important to note that the mean rating for none of the hospitals sampled fell in the unsatisfactory or very unsatisfactory range. Thus the study deals with a sample of respondents who basically were satisfied with the waiting room they experienced.

Figure 20

Average Visitor Overall Dis-satisfaction with the Waiting Room.

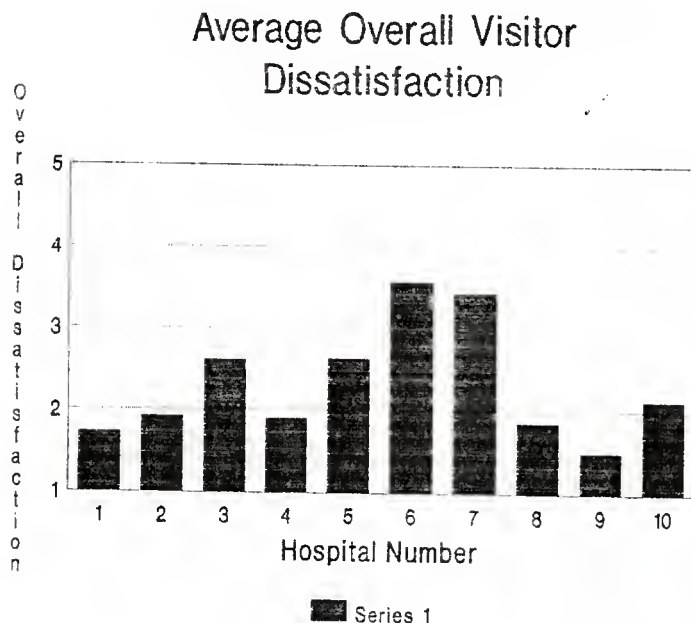


Figure 20: Average Overall Visitor Dissatisfaction with the Waiting Room

Wayfinding : location of the waiting room.

Figure 21 shows the average response for respondents from each hospital, to the question how easy or difficult was it to find the waiting room without the staff person helping the visitor. The rural Hospital 10 was the easiest probably due to its size and the general familiarity of the local townspeople with their hospital. Most large hospitals had easy to understand directions and wayfinding was not a major problem, except in Hospital 5, which had waiting rooms on different floor levels.

Size of the Waiting Room.

When asked to indicate their feeling about the size of the waiting room, the average response varied between small to big in size. The graph in Figure 22 shows the distribution of the average overall feeling by the visitors of the size of the waiting room , for each hospital. Most responses centered around the neither small/nor large response which could suggest the average size of the waiting rooms (10-15 square feet per person) was appropriate. Only Hospital 6 had an average response that suggested that the room was small. In reality the room did meet the guidelines of 15 square feet per person, but because the room had no windows, it may have appeared smaller.

Figure 21

Average response to question : How easy or Difficult is it to find the Waiting Room Without the Staff Helping.

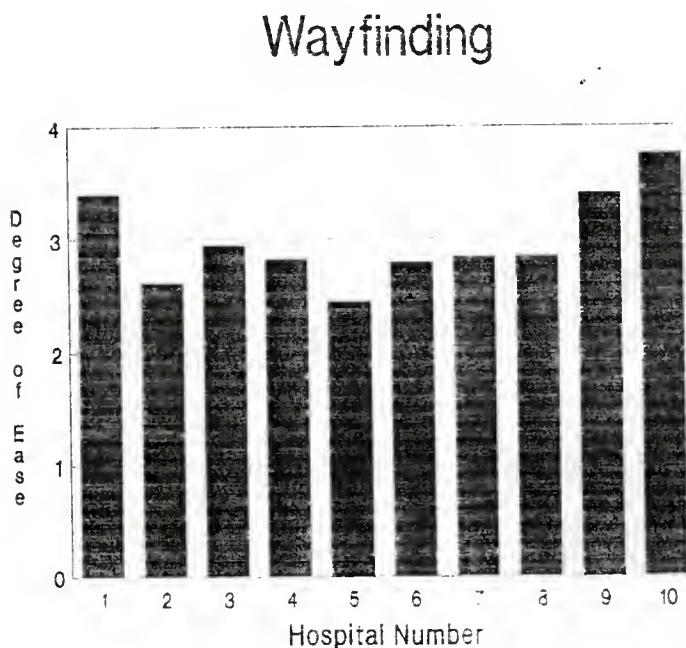


Figure 21 Visitor Ease in Finding the Waiting Room Without Staff Help.

Figure 22

Average Response to the Feeling of size of the Waiting Room.

## Feeling of Waiting Room Size

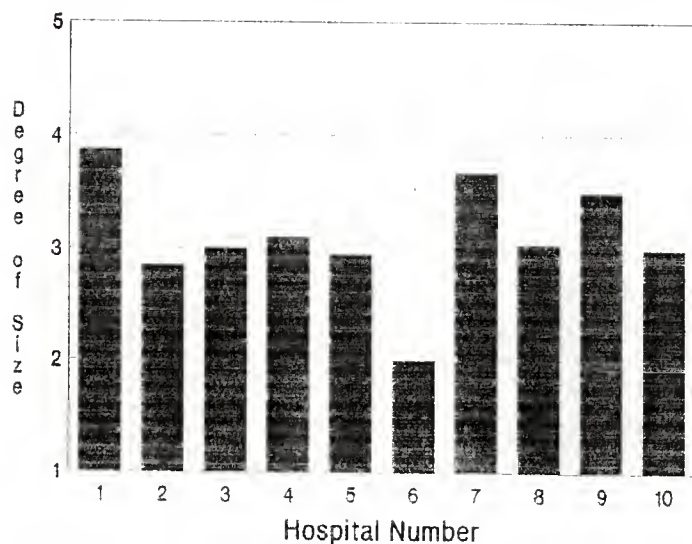


Figure 22 Average Response to the Feeling of Size of the Waiting Room.

## Seating Comfort

In Figure 23, the three large, urban hospitals (1, 2, and 3) had responses to how comfortable visitors found the seating around the average - neither comfortable nor uncomfortable. Hospital 3 had a reading below the neither/nor level. Table 4 shows the corresponding degree of conformity level based on the guidelines for seating comfort. Seating comfort in the three large, semi-urban hospitals (4, 5, and 6) ranged from comfortable to neutral (see Figure 22). Hospital 4 was a little better than comfortable.

In Hospital 7 (small, urban), the visitors found the seating "comfortable". In Hospital 8 (small, semi-urban), the response was "neither comfortable/nor uncomfortable", whereas in Hospital 9 (small, semi-urban), the average response found the seating to be closer to "comfortable". For Hospital 10 (small, rural), the average response was in-between neutral and "comfortable".

Cross-checking with the degree of conformity to guidelines in Table 4 under Scale D, Hospitals 6, 9, and 10 have a high conformity rating but a low visitor satisfaction rating. It is highly possible that the instruments of measure for conformity were not

Figure 23

Average response to how comfortable visitors found the seating in the waiting room.

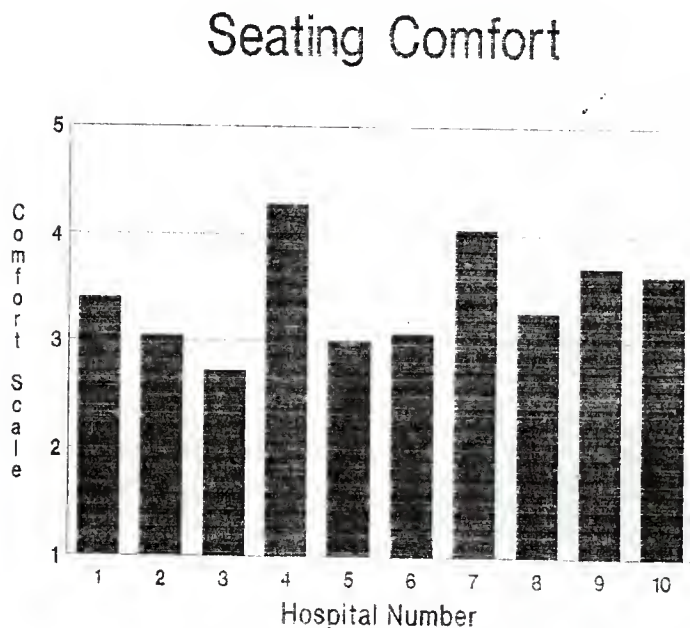


Figure 23: Average Response to How Comfortable visitors found the seating in the waiting Room.

cover all the aspects of seating comfort. Hospital 2 had a low conformity rating (50%) but a high visitor satisfaction rating (better than comfortable). This could be attributed to visitors being impressed by the newness of the waiting room in this hospital.

#### Location of Food Services.

Questioned as to how convenient/inconvenient the visitors found the location of the food services in Hospitals 1, 2, and 3, the responses ranged around the neither satisfactory/nor unsatisfactory level (see Figure 24). Hospital 3 was below the average, and hospital 2 was closer to being convenient. In Hospitals 4, 5, and 6, responses ranged from being close to convenient to a little more than the neutral level. Hospital 4 was close to convenient. Visitors in Hospital 7 found the location very convenient (this is the highest level of satisfaction in this category amongst all the hospitals surveyed). For Hospitals 8 and 9, the visitors rated location of food services in between neutral and convenient in Hospital 8, and neutral in the case of Hospital 9, whereas, for Hospital 10, the average response varied between neutral and inconvenient.

Comparing these visitor responses with the conformity Scale J (see Table 10), Hospital 1 shows a conformity level of only 33% whereas the visitors rated the food services in between neutral and convenient. Hospital 4, too, had a low conformity (66%) but a high visitor found the food services very convenient. One possible reason for for both hospitals' high ratings could be that both the cafeterias offered warm and freshly prepared meals besides the types that are offered through vending machines.

#### Location and Facilities in rest rooms

In Hospitals 1, 2, and 3, the average response to the question about satisfaction with the location and facilities in rest rooms for visitors ranged between the neutral and satisfactory (see Figure 25). Satisfaction responses in Hospitals 4, 5, and 6, ranged from a slightly less than neutral to satisfactory. Individually, hospital 4 was closer to being unsatisfactory and hospital 5 was closer to being satisfactory. The visitors in Hospitals 7 and 8 were neither satisfied nor dissatisfied with the rest room facilities, whereas, in hospital 9, they were satisfied with their rest rooms. For Hospital 10, the visitors were more than "satisfied" with the location and facilities in the rest rooms.

Cross checking the visitor ratings with the degree

Figure 24

Average response to how convenient or inconvenient visitors found the location of food services in each hospital.

## Location of Food Services

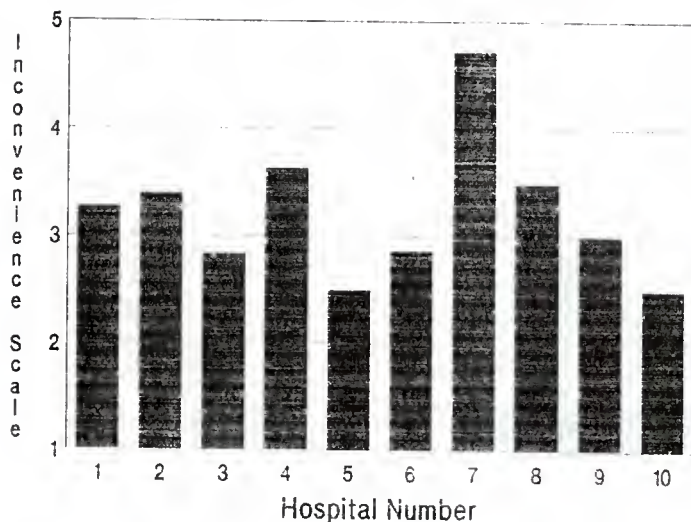


Figure 2 : Average Visitor Response to How Convenient/Inconvenient the Location Of Food Services Was.

Figure 25

Average response to satisfaction with the location of and facilities in the rest rooms.

## Dissatisfaction with Rest Room

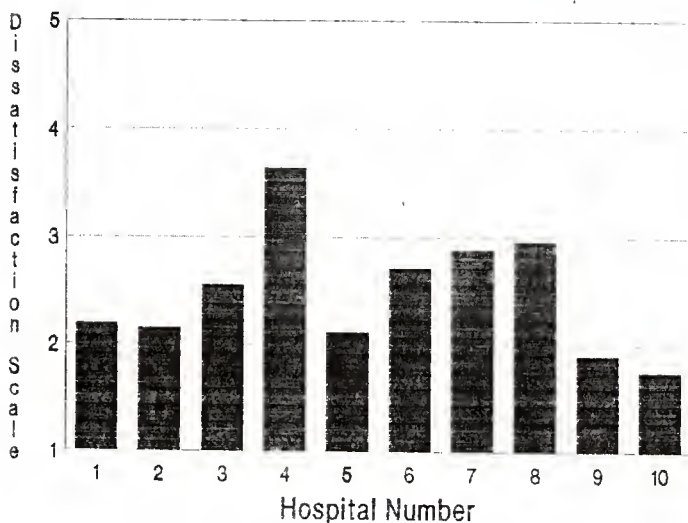


Figure 25: Average Visitor Dissatisfaction with the Rest Room Facilities in each Waiting Room.

of conformity ratings (see table 11), Hospitals 3, 4, 7, and 8 had high satisfaction ratings but low conformity to the guidelines. In most cases, the restrooms were not communal (only one person could use it at a time) and provided a better sense of privacy and security. The interior finishes of the toilets, which were not assessed by the guidelines, were of good quality. Hospital 2 had a low visitor rating as compared to a high degree of conformity to the guidelines. There may be some other factors such as the rest rooms being located too close to the telephone area that might have not been appreciated by the visitors.

#### Distance between ICU and waiting room

In Hospitals 1, 2, and 3, satisfaction with the distance between the ICU and the waiting room also evoked a response that averaged between neither/nor to close to very satisfactory (see Figure 26). Hospital 1 was close to very satisfactory. Hospital 5 and 6 had visitors more than satisfied with the distance between the ICU and the waiting room. Ratings from visitors at hospitals 4 were between the neutral and satisfactory level. For Hospital 7, the average visitor response lay between neutral and satisfactory level, about the satisfied level for hospital 8 and in between satisfied and very satisfied in the case of hospital 9. Visitors were almost always very satisfied

Figure 26

Average visitor satisfaction with the distance between the ICU and the waiting room.

## Distance Between ICU and Waiting Room

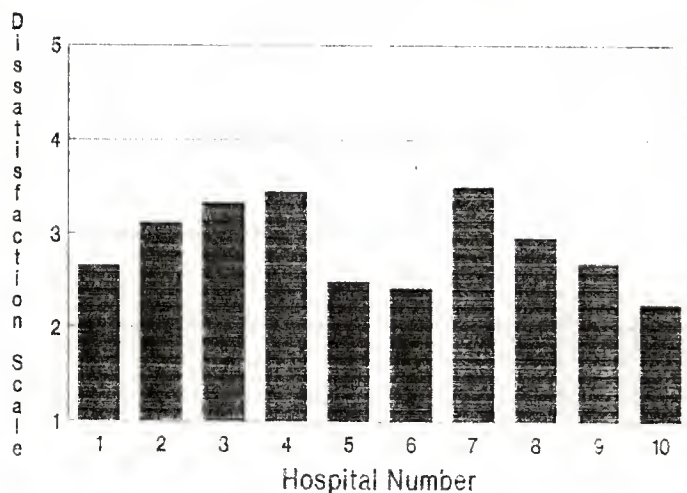


Figure 26 : Average Visitor Dissatisfaction with the Distance Between the ICU and the Waiting Room

about the distance between the ICU and the waiting room in Hospital 10. In most cases, the ICU was visually accessible from the waiting area, or was around the corner, with a common wall in between to provide a sense of proximity.

#### Amount of privacy in the waiting room

For Hospitals 1, 2, and 3, in response to the question on satisfaction with the amount of privacy in the waiting room, the responses ranged between neutral to satisfactory, with hospital 2 being closer to neutral (Figure 27), close to the unsatisfactory level for Hospitals 4 and 6, and a little better than the neutral level for Hospital 5. In Hospital 7, the average response ranged around the neutral, whereas, satisfaction with the amount of privacy in the waiting room was the same for both the hospitals 8 and 9, with the level being in between neutral and satisfied. For Hospital 10, the average response was around the neutral point. Most of the hospitals' responses averagely varied around the neutral point but the range of responses extended from very satisfied to very unsatisfied.

#### Perceived Stress

Asked how much amount of stress the visitor felt at that moment in Hospitals 1, 2, 3, 4, 5, and 6, the answers ranged from low stress to high stress, with Hospital 2

Figure 27

Satisfaction with the amount of privacy achieved in the waiting room.

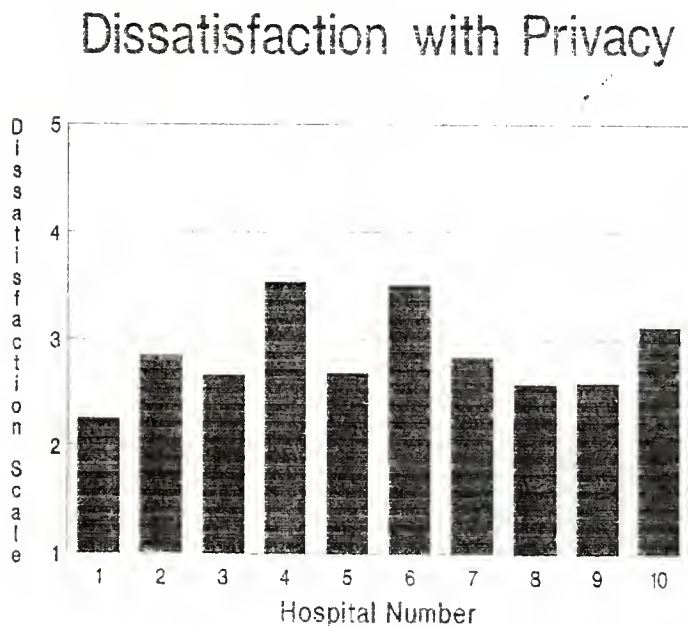


Figure 27: Average Visitor Dissatisfaction with the Amount of Privacy in the Waiting Room.

being closer to high stress (see Figure 28). Respondents at Hospital 4 perceived closer to low stress and those at hospital 5 perceived closer to high stress. The average responses in Hospitals 7 and 8 were in between moderate and low perceived stress. Hospital 9 had an average response close to moderate stress, whereas, the visitors in Hospital 10, on an average, perceived moderate to high stress in the waiting room. Even though the average perceived stress varied from low to high stress, some visitors reported very high to very low stress. It does lead one to speculate whether the visitors with very high stress participated in this survey and whether this sample represents visitors with primarily moderate or low perceived stress.

#### Change in stress

A follow-up question to the last one asked whether the qualities and the arrangement of the waiting room had any effect on their stress. It yielded an average response, shown in Figure 29, in Hospitals 1, 2, and 3 that was between no-change and reduced stress. Respondents perceived that the waiting room in hospital 4 had reduced their stress whereas in hospitals 5 & 6, the room was perceived to have made no difference. The average response in Hospital 7 was in between reduced and no-change and visitors in hospital 8 said on the average that the room had reduced the stress. For visitors in Hospitals 9 and 10,

Figure 28

Average perceived stress by visitors in the waiting room.

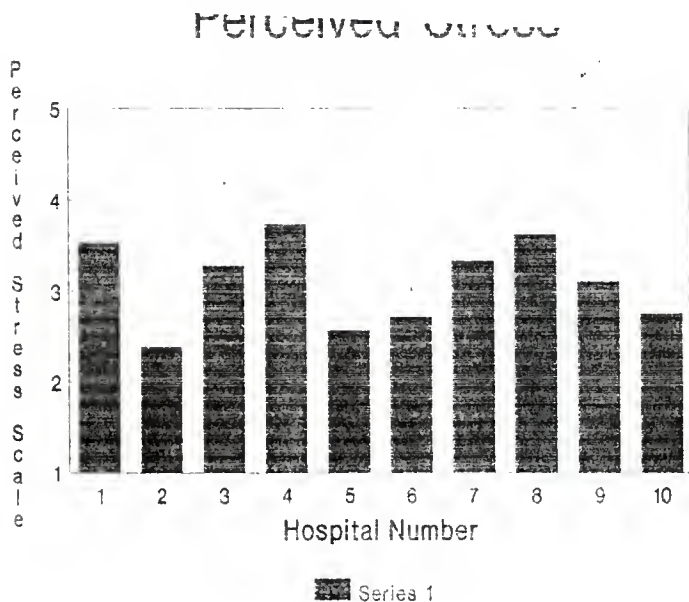


Figure 1. Average Visitor Perception of Stress in Waiting Room.

Figure 29

Effect of the arrangement in and qualities of the waiting room in reducing or increasing the stress level.

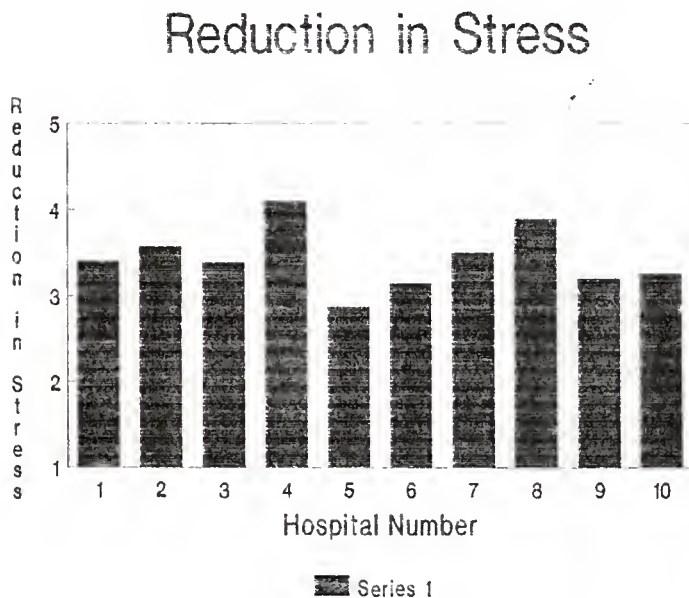


Figure 28. Effect of Arrangement and Qualities of Waiting Room in Reducing or Increasing Stress.

the room had made no change.

In retrospect, comparing the overall visitor satisfaction responses to the individual responses, as shown in Figure 30, it is observed that Hospitals with high overall satisfaction scores also have, on the average, high satisfaction score for individual issues. This was demonstrated in Hospitals 1, 2, 4, 5, 8, 9, and 10. Hospitals 6 and 7 have low overall satisfaction scores but, on an average, high individual satisfaction scores. This finding clearly shows that there are issues that the guidelines do not seem to address that might have a strong predictive effect on the satisfaction or dissatisfaction level. The nature of these unnamed factors remains an issue for future research.

#### An Overview of Conformity to Guidelines in Relation to the Average Overall Visitor Satisfaction with the Waiting Room.

This section makes the link between waiting room conformity to the design guidelines and visitor satisfaction ratings with the waiting room. For this purpose, Figure 20 will be referred to regularly as a basis from which each waiting room will be analyzed. Also included, in this section, is Table 6, which shows each hospital's conformity to the scales of the guidelines. This

Cross tabulation of visitor responses and conformity to guidelines for each hospital (Scales A & D)

Response 8:

Response 10:

117

Cross tabulation of visitor responses and conformity to guidelines for each hospital (Scales J & K)

[illegible]

--[1]-----	[2]-----	[3]-----	[4]-----	[5]----
very satisfied	satisfied	neither/nor	unsatisfied	very unsatisfied

Figure 30

Overall hospital satisfaction rating pattern

## Overview of Visitor Responses Satisfaction, Convenience, and Comfort

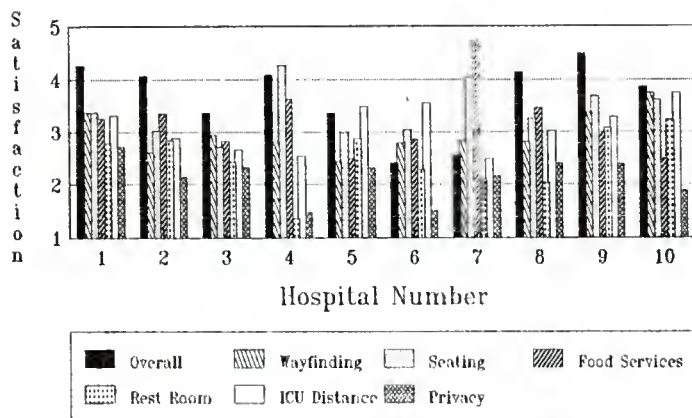


Figure : Overview of Visitors' Responses on Satisfaction and Convenience of Facilities.

analysis is based on each individual hospital and its conformity to the each scale of the guidelines.

#### Hospital 1

This large, urban hospital had an average visitor satisfaction response falling between satisfactory and very satisfactory. Looking at the hospital pattern of conformity to the guidelines in Table 6, it had a low conformity rating for allowing related activities, presence of an easily read wall clock, providing place for personal belongings, telephone conveniences, providing attractive reading and information display rack, and quality refreshments. It had an average 50% conformity for waiting room size and location, and rest room facilities. With generally low conformity ratings, it would be expected that the average overall visitor satisfaction level with the waiting room would be low. However, this is not the case. As can be seen, the visitors were satisfied with the waiting room. Several questions can be raised at this point. Do the visitors in a large, urban hospital expect or demand only a low level of services and facilities? Are the visitors too concerned with the immediate medical emergency to bother about the facilities available? Or, do the visitors accept what they are given, not wanting to annoy the medical staff personnel?

Table 6

This table shows the conformity levels of each hospital to every scale of the guidelines.

SCALE	HOSPITAL (Conformity in %)									
	1	2	3	4	5	6	7	8	9	10
A	50	100	75	100	100	100	25	100	50	50
B	40	100	60	80	20	40	20	60	0	60
C	100	67	33	100	100	33	33	33	100	67
D	87	50	63	100	75	100	50	87	100	63
E	100	87	75	100	100	100	25	100	87	38
F	0	0	0	100	100	100	100	100	100	0
G	0	100	0	0	0	0	0	0	100	0
H	27	91	27	56	36	46	18	27	27	36
I	0	0	100	0	0	0	0	0	0	100
J	33	83	67	67	83	67	67	33	67	67
K	50	67	33	17	67	50	33	50	50	50
L	100	100	100	75	75	75	25	75	25	100
M	80	60	60	80	100	60	20	60	100	40

## Hospital 2

This is another large, urban hospital that had a good rating with the overall visitor satisfaction with the waiting room. The average response centered around satisfied. Looking at the Table 6, there are only a few instances where the hospital has a low conformity rate with the guidelines, such as presence of an easily read clock, and providing an attractive reading and information display rack. Seating comfort had a 50% conformity level, and most of the other scales had a conformity rating of 60% or higher. This overall conformity appears to be reflected in the overall visitor satisfaction rating in Figure 6. This hospital is a highly sophisticated and modern facility with an apparent concern for user satisfaction as might be suggested by the design guidelines. The results for this hospital fit with the hypothesis.

## Hospital 3

Hospital 3 is the last of the three large, urban hospitals that participated in the study. It is owned and run by a local government. On an average, the overall visitor satisfaction with the waiting room was between satisfactory and neutral. Looking at the ratings for the conformity scales, quite a few had low ratings, including seating comfort, presence of an easily read wall clock, providing place for personal belongings, telephone

conveniences, and rest room facilities. Most of the other scales have a conformity of more than 50%. This corresponds with the satisfaction ratings. In public supported hospital such as this, the city funded hospital can ill-afford to provide expensive amenities. However, some of the facilities that were not provided were very basic and necessary. This raises some additional questions. Do low income users (most of the ones that use city supported hospitals are low income) of the hospital expect high quality services and amenities or are they satisfied with a lower level of environmental quality? Are the low income users aware of what amenities they might receive? If trade-offs are necessary to save on expenditures, what amenities could or could not be taken off the design recommendations for such a facility?

#### Hospital 4

This semi-urban hospital had an overall average visitor satisfaction rating of satisfied with the waiting room. Except for providing space for personal belongings, providing an attractive reading and information display rack, and rest room amenities, all other scales had a high conformity rating, ranging from 55% to 100%. Looking at the high overall conformity to the guidelines, it was expected that it would achieve a high satisfaction rating. This hospital is located on the outskirts of Kansas City, in a

very quiet surroundings, and one might expect the kind of visitors to the hospital to have a higher set of expectations for visitor amenities than those visiting Hospital 3. Some questions can be raised about the significant difference in the attitudes of hospitals from two different locations. Is it due to the premise that a sub-urban hospital serves on the average a better educated client? Or is it because since the cost of property is not as high, for the same amount of money a suburban hospital can afford to provide amenities which an urban hospital can not?

#### Hospital 5

Located in the second of the three large, semi-urban hospitals, this waiting room had a slightly above satisfaction scores for average overall visitor satisfaction with the waiting room. Looking at the conformity ratings, the waiting room fared slightly worse than Hospital 4. It had low ratings for allowing related activities, providing place for personal belongings, telephone conveniences, and providing attractive reading and information display rack. The other scales had a high conformity to the guidelines. This conformity appears to be reflected in the slightly above average satisfaction ratings mentioned earlier. This hospital is a teaching hospital, part of a university complex, and the visitors'

convenience appears secondary to the academic purpose in this environment. A number of conveniences and amenities were not provided. Visitors did often complain about the lack of privacy, environmental control, and efforts by the nursing staff to keep them informed of the medical procedures performed on the patients. The waiting areas provided seemed to have been afterthoughts and to have been located in spaces without any windows. There was no apparent concern for the psycho-social requirements of the visitors. There are some questions that are raised. Is this a usual practice in teaching hospitals to relegate visitor needs to the bottom of the priority list? If yes, then should teaching hospitals trade-off visitor comfort to accommodate academic procedures and requirements

#### Hospital 6

The last of the three large, semi-urban hospitals, its waiting room had a below average overall visitor satisfaction rating. Looking at the Table 6, it has a low conformity rating with the guidelines in allowing for related activities, seating arrangements, providing space for personal belongings, telephone conveniences, and providing an attractive reading and information display rack. The rest room facilities had a 50% conformity to the guidelines, and the other scales ranged from 60% to 100%. With the low conformity, the visitor ratings of below

average seem justified. Since this hospital is very conveniently located on a main street (with other hospitals offering the same amenities) it may have to improve upon the facilities that have been provided to the visitors simply to stay in the competition.

#### Hospital 7

This is a small, urban hospital located on a street that also has several large hospitals providing similar quality health care. The satisfaction rating amongst visitors was low (see Figure 20), between average and unsatisfied. Looking at Table 6, there was a severe lack of conformity in all scales except three. The ones that had some conformity ranged from 50% to 100%. The hospital also has the least number of days an average visitor spent in the waiting room amongst all the other hospitals studied. It is highly possible that due to lack of amenities, an average visitor may not spend time in the waiting room. This lack of basic amenities may be due to the fact that with limited square footage available, the hospital planners decided to devote that space to other necessary functions. The waiting room provided seemed more as an afterthought than a planned one. It lacked most of the basic amenities listed in the guidelines and fell short of providing the necessary psycho-social support to the visitor's prolonged stay. Thus, the following question is

raised. What is the lower limit of amenities needed in the waiting room to insure that people use it?

#### Hospital 8

This small, semi-urban hospital is built on a neighborhood concept (built to serve a particular neighborhood). The waiting room had an average overall visitor satisfaction rating in between satisfactory and very satisfactory. This rating was, however, not reflected in the conformity scales. The waiting room did not conform to the guidelines and had a low rating on many scales. Scales such as seating arrangement, providing place for personal belongings, telephone conveniences, providing attractive reading and information display rack, and providing quality refreshments, had a very low conformity level. Most other scales had a conformity level of around 50%. Despite this, the visitors found this waiting room very satisfactory. Some reasons could be that the hospital waiting room reflected a "homely" atmosphere with a very cheerful volunteer staff, which might have made up for all the lacking amenities. Also, expectancy level of visitors in a small hospital in this neighborhood could be generally lower. They may not have expected amenities and made do with what was there. One question raised by these data is the following : Are there factors in the social environment that can provide a higher satisfaction level other than the

one listed in the guidelines?

#### Hospital 9

This is the second of the two small, semi-urban hospitals that were studied. It is a new facility, still in the process of construction. It had the highest satisfaction scores among all the hospitals sampled. Looking at the Table 6, however, these ratings are not entirely reflected in the higher than average conformity to scales scores. Allowing for related activities, telephone conveniences, providing an attractive reading and information display rack, and smoking and non-smoking had a low conformity rating. Scales such as location and size, and rest room facilities were only 50% in conformity. These findings raise some questions once again. How does a semi-urban hospital with a very high-technology appearance achieve a high satisfaction score but not conform to the guidelines? One explanation could be that the "newness" of the hospital may increase visitor satisfaction, regardless of the amenities provided. The corporate image could provide signals of competency and neatness.

#### Hospital 10

This is a small, rural hospital, the only one in this category in this study. It is located in a small community outside Kansas City. The average overall visitor

satisfaction ratings were just below the satisfaction level. However, the waiting room has a low conformity to many of the guidelines. Scales such as flooring, wall coverings, and ceiling, presence of an easily read wall clock, telephone conveniences, and attributes of high stress waiting were low in conformity rating. Other scales such as location and size, and rest room facilities were around 50% in conformity. Despite the design, the average satisfaction rating was just below satisfactory. One reason could be the cheerful and friendly staff who almost invariably would know everybody in the town. The small town atmosphere and the short distances to visitors' home, may have overcome the lack of amenities that might exist a short distance away. It also may be that the general expectancy for amenities, once again, may be low as compared to the urban visitors.

Overall, there were three broad and distinct patterns of results noticed in this section. One, there were a group of hospitals (2, 4, 5, and 9) that had more than average to high overall conformity to the guidelines and a high satisfaction rating from the visitors). Two, there were a group of hospitals (6 and 7) that had a low overall conformity to the guidelines and a low overall visitor satisfaction rating. The third group of hospitals (1, 8, and 10) had a low overall conformity to the

guidelines but a high overall visitor satisfaction rating. A more detailed discussion on these contradictory findings will be attempted later in the analyses.

### Predictive Design Variables

The last analyses of this study, addressing the question of whether satisfaction with the environment and the waiting room characteristics are related, explored the possible relationships between the two through Pearson product-moment correlations and multiple regression analyses, and attempted to identify those design variables that have predictive value in determining visitor satisfaction with the waiting room.

The Pearson product moment correlations between the three outcomes (Perceived high stress, increase in stress, and dissatisfaction with the waiting room) and the conformity scales are shown in Table 7. Lack of conformity to guidelines on seating arrangements, and flooring, wall covering, and lighting, and various attributes of high stress waiting had a fairly high correlation (at  $p < \text{or} = 0.012$ ) with the overall dissatisfaction with the waiting room. Similarly, Lack of conformity to guidelines on

differentiating between smoking and non-smoking areas had a high correlation (at  $p < \text{or} = 0.05$ ) with the overall visitor dissatisfaction with the waiting room. However, lack of conformity to the guidelines on providing quality refreshments had a negative correlation (at  $p < \text{or} = 0.05$ ) with overall visitor dissatisfaction. For perception of high stress, lack of conformity to the guidelines on providing quality refreshments (at  $p < \text{or} = 0.01$ ) and places for personal belongings (at  $p < \text{or} = 0.05$ ) had a positive correlation with the increase in perceived stress. Lack of conformity to the guidelines on seating arrangements had a positive correlation (at  $p < \text{or} = 0.05$ ) with increase in stress due to the arrangement and qualities of the waiting room.

Table 8 shows the correlation between the different measures and visitors' personal and demographic characteristics and specific dimensions of their satisfaction with the waiting room. The increase in distance between home and hospital, the increase in difficulty to locate the waiting room, and the increase in the amount of privacy achieved in the waiting room, had a strong correlation with the overall dissatisfaction, whereas, increase in age had a negative correlation with the overall dissatisfaction. The time spent in the waiting room, ease in locating the waiting room, increase in

distance between home and hospital, seating comfort, convenience of food services, satisfaction with the rest room amenities, and the amount of privacy achieved had a strong correlation with the amount of perceived stress. Also, the gender of the visitor, increase in the age of the visitor, time spent in the waiting room, ease in finding distance between home and hospital, seating comfort, convenience of food services, satisfaction with the rest room amenities, and the amount of privacy achieved had a strong correlation with the amount of perceived stress. Also, the gender of the visitor, increase in the age of the visitor, time spent in the waiting room, ease in finding the waiting room, convenience of food services, satisfaction with the rest room amenities, and satisfaction with the amount of privacy achieved in the waiting room, were strongly correlated with the increase in stress. In the multiple regression analyses, the three dependent variables that were employed were :

1. The amount of stress being felt in the waiting room,
2. Whether the arrangements and the qualities of the waiting room have helped reduced or increased the stress, and
3. Overall visitor dissatisfaction with the waiting room.

Table 7

## Pearson Correlation (Guideline Scales)

Scale	Dependent Variables		
	R7	R15	R16
A	+0.098	-0.049	-0.023
B	-0.111	-0.065	-0.085
C	+0.373	-0.036	+0.147
D	+0.091	-0.161	-0.019
E	+0.199	-0.111	+0.029
F	-0.125	-0.132	-0.094
G	+0.175	+0.157	+0.075
H	+0.104	+0.102	+0.070
I	-0.037	+0.118	-0.024
J	-0.135	+0.212	+0.048
K	+0.098	+0.127	+0.086
L	+0.147	+0.023	+0.062
M	+0.205	-0.047	+0.084

Table 8

Pearson Correlation (Average Visitors' response)

Response	Dependent Variables		
	R7	R15	R16
R1	-0.104	-0.089	+0.265
R2	-0.134	+0.108	+0.138
Time	+0.005	+0.243	+0.224
R6	+0.193	+0.229	+0.075
R8	+0.221	+0.207	+0.296
R9	+0.117	+0.094	+0.111
R10	+0.002	+0.298	+0.144
R11	-0.045	+0.298	+0.196
R12	+0.163	+0.464	+0.402
R13	+0.104	+0.398	+0.607
R14	+0.230	+0.389	+0.292

The three variables mentioned above were assumed to be inter-related such that a high perceived stress due to various environmental presses will lead to increased stress amongst the visitors and finally, to dissatisfaction with the waiting room environment. The correlation between stress and environmental contributions to waiting room stress was +0.47, between stress and dissatisfaction was +0.11, and between environmental contributions and dissatisfaction was +0.09. Thus the three measures contained a great deal of variance that was not shared. The independent variables employed in the prediction were Personal Characteristics of the visitors (gender, age, time spent in the waiting room, and distance travelled from home to hospital), Hospital size, and Design Characteristics of the Waiting Room (scales A to M which are part of the design guidelines). The intent of the analyses was to determine those environmental variables that best predicted the above dependent variables through step-wise regression. For that, a series of combined fixed and forward step-wise regression analyses were performed.

The first three analyses used a summary score of conformity to all aspects of the design guidelines as the measure of design characteristics. After controlling for personal characteristics and hospital size, when lack of conformity to the guidelines was entered, it was found not

to be a significant predictor of perceived stress and was not linked to predicting increase in stress. Also, total conformity to design characteristics was a not significant predictor of overall dissatisfaction with the waiting room. Since the composite variable included so many dimensions, and hospitals had varied on their compliance to each of these, it was possible that the composite variable did not accurately reflect conformity to key environmental variables. Thus, the individual design scales were analysed for their predictive value. The second set of regression analyses employed these specific aspects of the design guidelines in the analyses. The results of the regression analyses are summarized in Tables 9, 10, and 11.

For the dependent variable "Amount of Stress Perceived", first the variables that would account for variations due to personal and experiential characteristics of the respondents were entered as a group into the regression. These variables included the gender of the respondents, age of the respondents, time spent in the waiting rooms, and the distance from the respondents' homes to the hospitals. As shown in Table 7, these variables predicted a total of 3% of the variance, with the greatest amount accounted for by the age of the respondent. Older people tended to perceive lower stress levels as compared to other age groups.

Next, the size of the hospital was entered into the regression, in order to account for variance due to this characteristic. It was confirmed that size did not play any significant role in the respondents' perception of stress, and the variance accounted for increased by only 1%. Finally, the dimensions of lack of conformity to the guidelines were allowed to enter in a forward step-wise fashion. When personal characteristics and hospital size were controlled in the equation, lack of amenities characterized by places for personal belongings, telephone facilities, attractive display for literature, quality refreshments, and rest room amenities (Scale GK) enhanced the prediction of visitors' perceptions of high stress (Sig.  $F = 0.0253$ ,  $df. = 2, 157$ ,  $F = 3.76$ ,  $R^2 = 0.04$ , and  $R^2$  adjusted = 0.034). However, The total model was not statistically significant ( $F = 0.094$ ).

When a similar analyses was completed without entering hospital size into the regression, it was indicated that the lack in conformity to the quality of flooring, wall covering, and lighting, and availability of a wall clock (Scale EF) entered into the regression for perception of high stress (Sig.  $F = 0.011$ ,  $df. = 1, 158$ ,  $F = 6.7$ ,  $R^2 = 0.04$ ,  $R^2$  adjusted = 0.03). This result indicates that hospital size and Scale EF maybe interrelated.

As part of the earlier analyses (Figure 29), it was found that average responses, for whether the waiting rooms in the hospitals had altered the residents' levels of stress, ranged primarily between "no change" and "reduced stress". To determine the kinds of variables whose lack of conformity that might contribute to the feeling of increased stress, a regression analyses similar to the last one was done. The results of this analysis are shown in Table 10. Again, variance attributable to personal characteristics was accounted for first. In this case, the personal characteristics accounted for 3% of the variance with the increase in distance from the hospital to the respondents' homes being the important factor amongst these personal characteristics. This result could have one plausible reason that as the distance increased between the house and the hospital, the visitors found the waiting room a more attractive place to reach.

When size of the hospital was considered, it was found that this factor accounted for 1% of the variance in increase in stress attributed to waiting room design by the visitors. Together, personal and hospital characteristics accounted for 4% of the variance. After controlling the personal and hospital characteristics, lack of conformity to the guidelines were considered using step-wise regression. In this case, the increase in lack of

Table 9

## Step-wise Regression Analyses

Dependent Variable : Perception of High Stress (R15)

Independent Variables	R2	Adj R2	Beta
Personal Charact.	0.03	0.001	
- Gender		(-) 0.08	
- Age			0.07
- Time		(-) 0.03	
- Distance			0.115
Hospital size	0.03	(-) 0.005	(-) 0.02
Conformity to Des. Guidelines			
-Scale AB			
-Scale CD			
-Scale EF			
-Scale GK	0.067	0.030	0.22
-Scale L			
-Scale M			

df= 6, 153 F= 0.096 p = 0.025

Table 10

## Step-wise Regression Analyses

Dependent Variable : Increase in Stress (R16)

Independent	R2	Adj R2	Beta
Variables			
Personal Charact.	0.03	0.026	(-)0.18
- Gender			
- Age			
- Time			
- Distance			
Hospital size	0.04	0.028	0.09
Conformity to			
Des. Guidelines			
-Scale AB			
-Scale CD			
-Scale EF			
-Scale GK			
-Scale L	0.071	0.041	0.16
-Scale M			
df : 1, 155 F: 5.15 p: 0.0247			

Table 11

## Step-wise Regression Analyses

Dependent Variable : Overall Dissatisfaction with the  
Waiting Room (R7)

Independent Variables	R2	Adj R2	Beta
Personal Charact.	0.095	0.07	
- Gender			(-) 0.01
- Age			(-) 0.31
- Time			0.07
- Distance			0.023
Hospital size	0.12	0.09	(-) 0.17
Conformity to Des. Guidelines			
-Scale AB			
-Scale CD	0.15	0.11	0.21
-Scale EF			
-Scale GK			
-Scale L	0.18	0.147	0.25
-Scale M			
df : 7, 152	F: 4.808	p: 0.000	

conformity in the ability to differentiate between smoking and non-smoking sections of the waiting room was related to visitor perceptions that the waiting room increased stress (Sig.F = 0.045, df.= 5, 151, F= 2.33, R2 = 0.072, R2 adjusted = 0.041). However, the amount of variance accounted for by the model remains quite small.

For the final regression analysis shown in Table 11, overall dissatisfaction was the dependent variable. Variables that would account for variations due to personal characteristics of the respondents were entered into the regression as a group. These variables accounted for a total of 10% of the variance. Age of the respondent was a significant predictor of overall dissatisfaction (Sig.F= 0.0001, df.= 1, 158, p= 15.54, R2 = 0.09, R2 adjusted = 0.084 ). As the age of the respondent decreased, his or her dissatisfaction with the waiting room tended to increase. This relationship is similar to the one identified for perceived stress.

When the variable of size of the hospital was entered, it was found that the variable added significantly to the prediction of overall dissatisfaction ( Sig. F= 0.0012, df.= 5, 154, F = 4.27, R2 = 0.12, R2 adjusted = 0.09). When the lack in conformity to the guidelines was considered using step-wise forward regression, it was

found that the lack in conformity to the design guidelines on seating arrangements and comfort was associated with a higher level of dissatisfaction with the waiting room amongst the visitors (Sig.  $F = 0.0005$ ,  $df = 6, 153$ ,  $p = 4.33$ ,  $R^2 = 0.15$ ,  $R^2_{\text{adjusted}} = 0.11$ ). The findings also indicated that the lack in ability to differentiate between smoking and non-smoking sections of the waiting room was related to a higher dissatisfaction with the waiting room amongst the visitors. Thus the total model, which controlled for personal characteristics and hospital size, and included lack of conformity in seating comfort and smoking and non-smoking provisions, accounted for a total of 18% of the variance in dissatisfaction. (Sig.  $F = 0.0001$ ,  $df = 7, 152$ ,  $F = 4.8$ ,  $R^2 = 0.18$ ,  $R^2_{\text{adjusted}} = 0.14$ ).

A final regression analysis was performed to explore the role of satisfaction with specific aspects of design in contributing to the overall assessment of satisfaction. With the dependent variable as the overall visitor satisfaction with the waiting room, various sub-scales of Seating Arrangements and Comfort, and Ability to Differentiate between Smoking and Non-smoking Areas of the Waiting Rooms were entered as the independent variables in a multiple regression analyses to understand better the dimensions that contributed to the overall rating of

satisfaction (see Table 12). Using step-wise forward regression, and controlling for personal characteristics, and hospital size, the results of the regression indicated that the ability of people to arrange themselves in different size social groups was the highest predictor of overall satisfaction with the waiting room amongst the visitors (Sig.F= 0.0001, df.= 6, 153, F= 5.25, R2 = 0.17, R2 adjusted = 0.14 ). Controlling for personal characteristics and hospital size, when the several dimensions of visitor responses of satisfaction were entered as group, with overall dissatisfaction being the dependent variable, the dimensions of satisfaction were found to be a significant predictor overall dissatisfaction and accounted for about 20% of the variance (Sig. F = 0.0014, df = 11, 148).

To summarize the findings of the regression analyses, they indicated that the increase in age of the respondents was associated with lower perceptions of stress amongst the visitors in the waiting room. Of all the design characteristics, the lack of conformity to the guidelines governing availability of amenities such as telephones, rest rooms, quality refreshments, and places for personal belongings, predicted the greatest variation in perceptions of stress amongst visitors, although it was not significant statistically when the total model was evaluated. The

Table 12

## Step-wise Regression Analyses

Dependent Variable: Overall Visitor Satisfaction

Ind. Variable	R <sup>2</sup>	Adj. R <sup>2</sup>	Beta
Personal Charact.	0.094	0.071	
Gender			-0.05
Age			-0.26
Time			0.07
Distance			0.01
Hospital Size	0.12	0.09	-0.26
H10	0.17	0.14	0.24
H11			
H12			
H13	0.20	0.16	0.20
H14			
H15			
H16			
H17			
H18			
H19			
H54			
H55			
H56			
H57			
df. = 6, 153 F = 5.25      p = .0001			

findings also indicated that the stress in the visitors did not increase with the increase in the distance between the hospital and the respondent's home. For the same variable, addressing stress changes attributed to the waiting room, it was further indicated that the increase in the lack of conformity to the design guidelines for differentiating between the smoking and non-smoking sections of the waiting rooms meant increased stress. As part of the analyses for overall visitor satisfaction with the waiting room, it was established that increased age of the visitors was not associated with overall dissatisfaction with the waiting room. Also, lack in conformity to the guidelines on seating arrangement and comfort was associated with a higher level of overall dissatisfaction with the waiting room. It was also indicated that within the parameters of seating arrangement and comfort, the ability of people to arrange themselves in different size social groups was the highest predictor of overall satisfaction with the waiting room.

## Chapter 4

### CONCLUSIONS

The three questions that were raised earlier in the study are discussed here in view of the findings that have been presented.

There seems to be considerable variability in the degree to which hospitals conform to the guidelines (though none were designed intentionally to be conforming). When individual scales of the design guidelines were considered, there were some that were in high conformity to the guidelines for one kind of criteria for hospital waiting rooms and in low or no conformity in another kind. For example, in terms of waiting room size, the larger hospitals were more or less in total conformity, whereas the smaller hospitals had a low conformity. In terms of seating arrangements, the larger hospitals on the average had a higher conformity level as compared to the smaller hospitals. Where the presence of an easily read wall clock was concerned, no large, urban hospital or small, rural hospital conformed to the guidelines. This could be due to the fact that a clock is a factor that can easily be overlooked. Overall, the small, urban hospital did have a very low conformity to the guidelines. This could be attributed to financial and spatial reasons. The large,

urban and semi-urban hospitals had a better conformity ratings with the guidelines in terms of differentiating between smoking and non-smoking areas. The smaller hospitals tended to have a low conformity rating.

When considering overall conformity to the guidelines and stress in the waiting room, there was no significant relationship found between the two variables. However, visitors perceived high stress when the waiting room did not have high conformity to the design guidelines on places for personal belongings, telephone amenities, display racks for magazines, quality refreshments, and rest room conveniences. It was also observed that the increase in stress amongst visitors was related to the waiting areas not conforming to the guidelines that differentiate smoking and non-smoking areas. High perceived stress and increased stress were also found to have a low correlation with the overall dissatisfaction with the waiting room. It was also indicated that age of the visitor, as part of the uncontrollable aspects of the design, helped predict a lower level of perceived stress amongst visitors (higher age, less perceived stress). As part of reducing stress, it was found that the increase in the distance between visitor's home and the hospital predicted a reduction in visitor stress. Clearly, a major component to these perceptions, that of individual users, is beyond the realm

of influence by design characteristics.

When one considered degree of conformity to the design guidelines and overall visitor satisfaction with the waiting room, three typical patterns were evident in the results. When the degree of conformity was high, the overall visitor satisfaction was high, too. This was demonstrated in Hospitals 2, 4, 5, and 9 where the level of overall visitor satisfaction was high and so was the conformity to the guidelines.

The second type of result attained was where the low conformity to the guidelines brought about a low overall visitor satisfaction rating. This conclusion was substantiated by Hospitals 6 and 7. In both cases, the degree of conformity of the waiting room to the design guidelines was low and the overall visitor satisfaction with the waiting room was below the neutral point (neither satisfied nor dissatisfied). In the case of Hospital 6, the individual ratings of satisfaction on various design issues were about the neutral. However, the overall dissatisfaction rating was high. Clearly, there were some other factors that brought about a low overall satisfaction level that were not assessed in this study.

The third pattern of results was when the degree of

conformity did not predict visitor satisfaction with the waiting room. There were instances where the overall degree of conformity was low but the average overall visitor satisfaction with the waiting room was high. This happened in Hospitals 1, 8, and 10. Several reasons were suggested, including, quality of health care, cheerful and helping staff, and awareness of user rights. It is also possible that non-availability of amenities became a minor issue when compared to the condition of the patients. It must be noted that two out of three hospitals with low conformity but high satisfaction ratings belong to the small category. This may raise questions about the degree to which the the guidelines apply to small, semi-urban and rural hospitals.

There was, however, no instance where the conformity was high but the satisfaction ratings were low. It seems when the guidelines are followed there are high satisfaction ratings amongst the visitors, but that high satisfaction can also be achieved through other means as well.

In the analyses, it was found that the overall design was significantly related to the overall visitor dissatisfaction with the waiting room. Amongst all the scales, it was indicated that the lack of conformity to seating comfort and arrangement most predicted overall

dissatisfaction with the waiting room. The ability to arrange seating in small social groups was the main predictor, in that scale, of overall satisfaction. It was also found that the ability to differentiate between smoking and non-smoking areas in the waiting room also predicted a higher overall visitor satisfaction with the waiting room environment.

Carpman's model (1986) predicted high overall visitor satisfaction with the waiting room if the waiting room conformity to the guidelines, listed by Carpman and her associates, was high. In this study, several hospitals support the model. When conformity to the guidelines was high, the overall visitor satisfaction achieved was high. When the conformity to the guidelines was low, the overall visitor satisfaction with the waiting room was low, too. However, several hospitals (1, 8, and 10) fell outside this model when their conformity to the guidelines was low but the overall visitor satisfaction achieved was high. This was particularly true for hospitals that belonged to the small, and semi-urban, rural category. Several reasons were hypothesized including cheerful staff, low expectations of the visitors, and personality traits of the visitors. Since design characteristics of the waiting room and personal characteristics of the visitors accounted only for 20% of the variance, there were clearly other unaccounted for

factors that were influencing visitors' responses and their overall satisfaction levels with the waiting room. Some of these factors, that were not measured but may be important, could include the personality of the visitor, the severity of illness of the patient, and the users' ability to withstand environmental press.

There could be a number of other reasons why this study did not confirm Carpman's model fully. It could be possible that the sample of visitors studied did not truly represent the visitors that use those high stress waiting areas. It could also be that the very high stressed visitors did not participate in the survey as it was on a voluntary basis. Also, since the exact operational definitions of the variables measured by Carpman were not known, the difference between those and the ones used in this study could account for the results which only partially support her model.

#### Future research

Some questions were raised during the course of the analyses that could be used as a basis for future research into issues related with visitor satisfaction with high stress waiting areas in hospitals. Some of those questions include: Are the visitor expectations of waiting room amenities different for hospitals in different locations

and sizes ? Are visitors in urban context more aware of their rights to services as compared to other regions ? Do expectations from waiting rooms differ according to the visitor's socio-economic background? Do amenities differ depending on the context (size and location) of the hospital? If trade-offs on amenities become necessary, what are the more important amenities that should have a higher trade-off value? Are there variables in the social environment (of visitors) that could account for a higher level of satisfaction with the waiting rooms but were not considered? Similarly, are there variables in the social environment (of visitors), that could account for a lower perceived and experienced stress levels in the waiting room, that were not considered?

Some of the major issues that need further extensive research include: Are stress in the environment and satisfaction with the environment strongly related ? If they are not related strongly, should the two issues be studied separately?

#### Design Recommendations to Hospitals

Most of the design recommendations that have evolved out of this study are part of the section on conclusions

above. In this section, some of those design recommendations have been applied to suit specific design situations. To achieve an overall high level of satisfaction :

1. Provide seating that can be easily arranged in different sized groups, is comfortable and convenient to all age groups, supports the back, enables people to get up from a sitting position , have arm rests, etc. If cost matters, it would be more appropriate to first achieve a level of flexibility within the seating arrangements and then follow other aspects of quality seating.
2. Differentiate smoking sections from the non-smoking sections, and provide adequate ventilation devices.

Those design variables that could help reduce stress among the visitors are :

1. Provide convenient telephones that are accessible to handicapped and usable by all kinds of people including the aged, hard of hearing, children, and adults. These telephones should have audio and visual privacy.
2. There should be a place to store personal belongings

if the visitor plans to spend a long time in the waiting room. Places like closets, coat hangers, shelves, and tables, can help.

3. Rest room facilities should include all the basic necessities, electrical outlets, clothes hooks, counter tops in ladies toilets, be made accessible to the handicapped, etc.
4. Provide 24 hour access to quality refreshments for the visitors who might have to spend the night in the waiting room.
5. Provide an attractive rack for displaying reading material and other literature.
6. Make the drinking fountain accessible to people of all age groups and the handicapped.

Overall, most of these design recommendations are, maybe intentionally or unintentionally, adhered to during a design process. When the budget or time is limited, it may become important to understand where the trade-offs can be made. It was indicated earlier that amongst all the design sub-scales for seating arrangements and seating comfort, providing flexibility in seating positions for ease in

conversation was the highest predictor of overall satisfaction. Precluding compliance to some dimensions such as size, providing amenities may become more important. Those amenities include : providing a separate smoking area close to the waiting area, providing access to quality refreshments throughout the day, and providing a place to store personal belongings. The design recommendations are, for most part, easily applied in both situations : a new construction, and a renovation project. The final design recommendations would be based on the amount of finance and space for change available.

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8. Without the staff helping you, how easy or difficult was it to find the waiting room the first time you came here.

--[1]-----[2]-----[3]-----[4]-----[5]--  
very easy    easy            not so easy    difficult    very  
                                 not so difficult            difficult

9. On the scale below, please indicate how you feel about the size of the waiting room ?

--[1]-----[2]-----[3]-----[4]-----[5]--  
too small    small            neither small    big            too big  
   nor big

10. How comfortable or uncomfortable do you find the seating in this room ?

--[1]-----[2]-----[3]-----[4]-----[5]--  
very            uncomfortable    neither    comfortable    very  
uncomfortable            nor            comfortable    comfortable

11. Do you find the location of the food services (including vending machines) convenient or inconvenient. ?

--[1]-----[2]-----[3]-----[4]-----[5]--  
very            inconvenient    neither/nor    convenient    very  
inconvenient    convenient

12. Are you satisfied with the location and facilities provided in the rest rooms ?

--[1]-----[2]-----[3]-----[4]-----[5]--  
very            satisfied    neither/nor    unsatisfied    very  
satisfied    unsatisfied

13. Are you satisfied with the distance between the ICU and this waiting room ?

--[1]-----[2]-----[3]-----[4]-----[5]--  
very            satisfied    neither/nor    unsatisfied    very  
satisfied    unsatisfied

14. Are you satisfied with the amount of privacy that you can get in this waiting room ?

--[1]-----[2]-----[3]-----[4]-----[5]--  
very            unsatisfied    neither/nor    satisfied    very  
unsatisfied    satisfied

15. At this moment, how much stress do you feel ?

--[1]-----	[2]-----	[3]-----	[4]-----	[5]--
very high	high	neither high	low	very low
stress	stress	nor low	stress	stress

16. Do you think the arrangement and the qualities of this waiting room have reduced or increased your stress ?

--[1]-----	[2]-----	[3]-----	[4]-----	[5]--
Highly	increased	no change	reduced	highly
increased				reduced

16. If any, are there things in this waiting room that you are unsatisfied with ? Are there things that you are satisfied with ?

Thank you very much for your support. Please seal this in an envelope and leave it with the person in-charge of the waiting room.

VISITOR SATISFACTION IN ICU AND RECOVERY WAITING ROOMS  
IN ACUTE-CARE HOSPITALS

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### VISITOR SATISFACTION IN I.C.U WAITING ROOMS

Visitors may play more than a passive role in the recovery of the patient by providing a therapeutic effect on the patient, relieving loneliness, and reducing stress. They spend a large portion of their time in waiting rooms and are often subjected to environmental pressures (compounded with the addition of worrying about the critically ill friend) that could cause dissatisfaction with their environment and environmental stress.

Research, conducted by Carpman and her associates at the University of Michigan teaching hospital (Reizenstein, et al, 1981), and as part of the Patient and Visitor Participation project, focused on the design related needs of the patients and visitors. This project developed a list of design-related guidelines (Carpman, et al, 1986) to help ensure visitor satisfaction with waiting rooms of the hospital. To enhance and extend their generalizeability, these guidelines should be evaluated further on the basis of similar types of ICU waiting rooms, in hospitals ranging in size (small to large) and regional context (urban to rural).

This study evaluated the conformity of ten ICU waiting rooms to the guidelines, their relationship to levels of

visitor satisfaction, and attempted to refine the guidelines.

Ten Kansas City hospitals were selected after prior approval from their administrators. The waiting rooms were rated on the basis of operational definitions derived from the guidelines. Visitors were requested to fill questionnaires that measured their level of satisfaction with the amenities and the characteristics of the waiting rooms. Descriptive and regression analyses were performed on the data collected. Conformity to guidelines was associated with visitor satisfaction with the waiting room in many hospitals. However, semi-rural and rural hospitals do not need full conformity with the guidelines to obtain overall visitor satisfaction. Thus the relationship between design characteristics, satisfaction and stress appear complex, and may be influenced by personal factors and the social environment. Findings also suggested that providing comfortable seating and differentiating smoking and non-smoking sections of the waiting room reduced the perception of stress amongst visitors.